website http://www.lgservice.com
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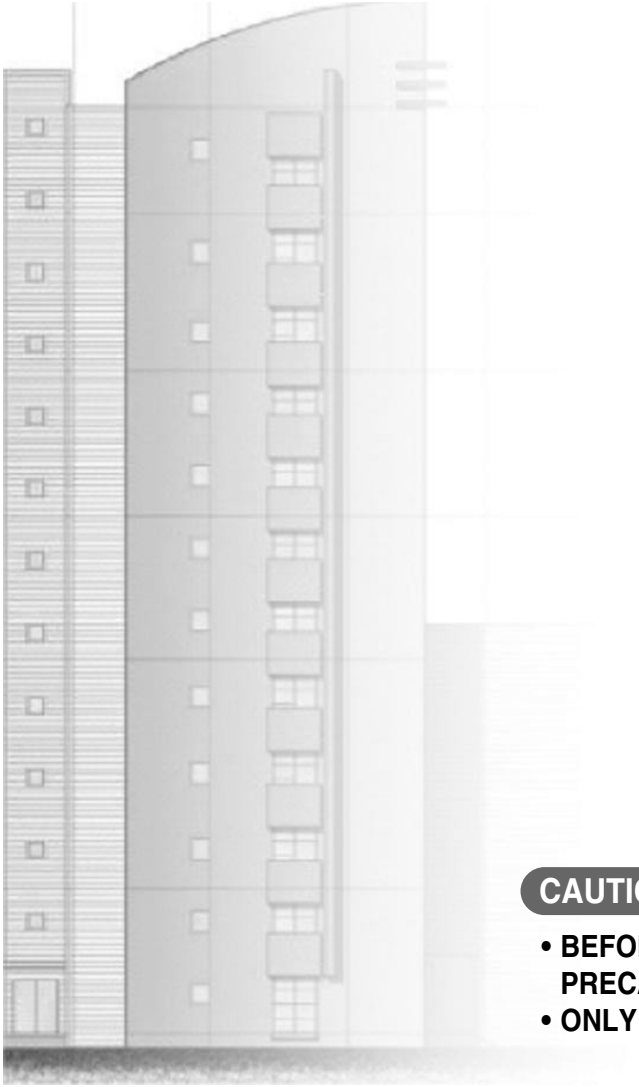
LG

MULTI V™ System

Heat Pump Air Conditioner

SERVICE MANUAL

MODELS: CRUN/CRNN Series



CAUTION

- **BEFORE SERVICING THE UNIT, READ THE SAFETY PRECAUTIONS IN THIS MANUAL.**
- **ONLY FOR AUTHORIZED SERVICE PERSONNEL.**

MULTI V™ System SERVICE MANUAL

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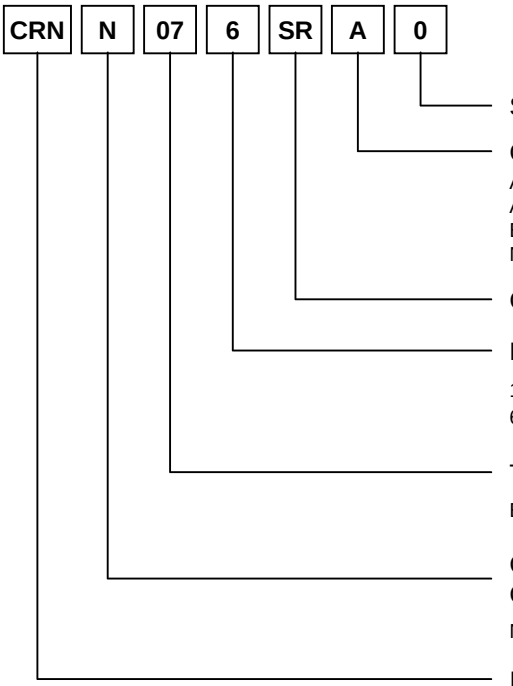
Model Name Nomenclature

Indoor Unit



Serial Number

Combinations of functions
A: Basic Function
Art Cool Type Panel Color
B: Blue, C: Cherry, D: Wood, M: Metal
N: Walnut, R: Mirror, W: White, G: Gold

Chassis Name

Electrical Ratings
1: 1ø, 100V~115V, 60Hz, 2: 1ø, 220V~240V, 60Hz
6: 1ø, 220V~240V, 50Hz, 7: 1ø, 100V~115V, 50Hz

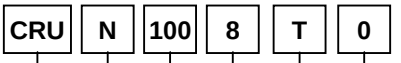
Total Cooling Capacity in Btu/h unit
Ex) 5,000 Btu/h → '05' , 18,000 Btu/h → '18'

Combination of Inverter Type and
Cooling Only or Heat Pump or Heat Recovery
N: AC Inverter and H/P, V: AC Inverter and C/O

Indicates that this is MULTI V System indoor unit using the R-407C.

Note: Suffix - Look: Wall Mounted Type
- Panel: Ceiling Mounted Cassette Type

Outdoor Unit



Serial Number

Air Discharge Type
S: Side discharge
T: Top discharge

Electrical Ratings
8: 3ø, 380V~415V, 50Hz, 9: 3ø, 380V~415V, 60Hz
A: 3ø 220V, 50Hz, B: 3ø, 220V, 60Hz
C: 3ø, 440V~460V, 50Hz, D: 3ø, 440V~460V, 60Hz

Total Cooling Capacity in Horse Power(Hp) unit
Ex) 4.5 Hp → '45' , 10 Hp → '100'

Combination of Inverter Type and
Cooling Only or Heat Pump or Heat Recovery
N: AC Inverter and H/P, V: AC Inverter and C/O

Indicates that this is MULTI V System outdoor unit using the R-407C.

Model Names

Indoor Unit

Category	Type	Chassis Name	Model Name								
			Capacity, kW(Btu/h)								
			2.1 (7,000)	2.6 (9,000)	3.5 (12,000)	5.3 (18,000)	7.0 (24,000)	8.2 (28,000)	10.6 (36,000)	12.3 (42,000)	14.1 (48,000)
Wall Mounted Type	General	**SR**	CRNN 076SRA0	CRNN 096SRA0	CRNN 126SRA0	-	-	-	-	-	-
		ST	-	-	-	CRNN 186STA0	-	-	-	-	-
Art Cool	Mirror	**SU**	CRNN 076SU*0	CRNN 096SU*0	CRNN 126SU*0	-	-	-	-	-	-
	Art Cool	**SP**	-	CRNN 096SP*0	CRNN 126SP*0	-	-	-	-	-	-
	Wide	**SV**	-	-	CRNN 126SV*0	CRNN 186SV*0	-	-	-	-	-
Ceiling Cassette	1 Way	**TC**	CRNN 076TCA0	CRNN 096TCA0	CRNN 126TCA0	-	-	-	-	-	-
	4 Way	**TE**	-	-	CRNN 126TEA0	CRNN 186TEA0	-	-	-	-	-
		TD	-	-	-	-	CRNN 246TDA0	CRNN 286TDA0	CRNN 366TDA0	CRNN 426TDA0	CRNN 486TDA0
Ceiling & Floor	Convertible	**VB**	-	-	-	CRNN 186VBA0	CRNN 246VBA0	-	-	-	-
Ceiling Concealed Duct	High Static	**BH**	-	-	-	CRNN 186BHA0	CRNN 246BHA0	-	-	-	-
		BG	-	-	-	-	-	CRNN 286BGA0	CRNN 366BGA0	CRNN 426BGA0	-
		BE	-	-	-	-	-	-	-	-	CRNN 486BEA0
	Low Static	**BN**	CRNN 076BNG0	-	-	-	-	-	-	-	-
		BJ	-	CRNN 096BJG0	CRNN 126BJG0	-	-	-	-	-	-
Floor Standing	With Case	**CAA**	CRNN 076CAA0	-	-	-	-	-	-	-	-
		CBA		CRNN 096CBA0	CRNN 126CBA0	-	-	-	-	-	-
		CCA				CRNN 186CCA0					
		CDA					CRNN 246CDA0				

Outdoor Unit

Series	Model name		Power Supply
	Capacity, Hp(Btu/h)		
	4.5 (44,000)	10 (95,500)	
Inverter Series (Heat Pump)	CRUN 458S0	CRUN 1008T0	3ø, 4W,380V~415V, 50Hz

Safety Precautions

To prevent indury to the user or other people and property damage the following instructions must be followed.

■ Incorrect operation due to ignoring instruction will cause harm or damage. The seriousness is classified by the following indications.

⚠**WARNING**	This symbol indicates the possibility of death or serious injury.
⚠**CAUTION**	This symbol indicates the possibility of injury or damage to properties only.

■ Meanings of symbols used in this manual are as shown below.

	Be sure not to do.
	Be sure to follow the instruction.
	This symbol indicates a part which must be grounded.
	This symbol indicates that caution should be taken with rotating parts. (This symbol is displayed on the main unit label.) <Color: Tellow>
	This symbol indicates that the main switch must be turned off before service. (This symbol is displayed on the main unit label.) <Color: Blue>
	This symbol alerts you to the risk of electric shock. (This symbol is displayed on the main unit label.) <Color: Yellow>
	This symbol alerts you to the risk of hot surface. (This symbol is displayed on the main unit label.) <Color: Yellow>
	This symbol alerts you to hazards that could cause harmto the air conditioner.
NOTICE	This symbol indicates special notes.
ELV	Pay attention to electric shock. And at servicing, please shut down the power supply for both of Indoor and Outdoor Unit.

⚠WARNING

Carefully read the labels affixed to the main unit.

Cautions before installation

⚠ WARNING

Use the specified cables for wiring. Make the connections securely so that the outside force of the cable is not applied to the terminals.

- Inadequate connection and fastening may generate heat and cause a fire.

Always use accessories specified by LG Electronics.

- Ask an authorized technician to install the accessories. Improper installation by the user may result in water leakage, electric shock, or fire.

Never repair the unit. If the air conditioner must be repaired, consult the dealer.

- If the unit is repaired improperly, water leakage, electric shock, or fire may result.

Do not touch the heat exchanger fins.

- Improper handling may result in injury.

If refrigerant gas leaks during service work, ventilate the room.

- If the refrigerant gas comes into contact with a flame, poisonous gases will be released.

Have all electric work done by a licensed electrician according to "Electric Facility Engineering Standard" and "Interior Wire Regulations" and the instructions given in this manual and always use a special circuit.

- If the power source capacity is inadequate or electric work is performed improperly, electric shock and fire may result.

Securely install the cover of control box and the panel.

- If the cover and panel are not installed properly, dust or water may enter the outdoor unit and fire or electric shock may result.

When installing and moving the air conditioner to another site, do not charge it with a refrigerant different from the refrigerant (R407C) specified on the unit.

- If a different refrigerant or air is mixed with the original refrigerant, the refrigerant cycle may malfunction and the unit may be damaged.

If the air conditioner is installed in a small room, measures must be taken to prevent the refrigerant concentration from exceeding the safety limit when the refrigerant leaks.

- Consult the dealer regarding the appropriate measures to prevent the safety limit from being exceeded. Should the refrigerant leak and cause the safety limit to be exceeded, hazards due to lack of oxygen in the room could result.

When moving and reinstalling the air conditioner, consult the dealer or an authorized technician.

- If the air conditioner is installed improperly, water leakage, electric shock, or fire may result.

After completing service work, make sure that refrigerant gas is not leaking.

- If the refrigerant gas leaks and is exposed to a fan heater, stove, oven, or other heat source, it may generate noxious gases.

Do not reconstruct or change the settings of the protection devices.

- If the pressure switch, thermal switch, or other protection device is shorted and operated forcibly, or parts other than those specified by LG Electronics are used, fire or explosion may result.

⚠ CAUTION

Do not install the unit where combustible gas may leak.

- If the gas leaks and accumulates around the unit, an explosion may result.

Do not use the air conditioner where food, pets, plants, precision instruments, or art-work are kept.

- The quality of the food, etc. may deteriorate.

Do not use the air conditioner in special environments.

- Oil, steam, sulfuric smoke, etc. can significantly reduce the performance of the air conditioner or damage its parts.

Do not install the unit on a structure that may cause leakage.

- When the room humidity exceeds 80% or when the drain pipe is clogged, condensation may drip from the indoor unit. Perform collective drainage work together with the outdoor unit, as required.

Take measures to prevent children from touching the unit.

- Injuries such as cuts could occur if a child touches the surface of the fins on the heat exchanger.

Cautions for electrical work and movement

⚠ CAUTION

Ground the unit.

- Do not connect the ground wire to gas or water pipes, lightning rods, or telephone ground lines. Improper grounding may result in electric shock.

Install the power cable so that tension is not applied to the cable.

- Tension may cause the cable to break and generate heat and cause a fire.

Use power cables of sufficient current carrying capacity and rating.

- Cables that are too small may leak, generate heat, and cause a fire.

Use only a circuit breaker and fuse of the specified capacity.

- A fuse or circuit breaker of a larger capacity or a steel or copper wire may result in a general unit failure or fire.

Do not wash the air conditioner units.

- Washing them may cause an electric shock.

Be careful that the installation base is not damaged by long use.

- If the damage is left uncorrected, the unit may fall and cause personal injury or property damage.

Safely dispose of the packing materials.

- Packing materials, such as nails and other metal or wooden parts, may cause stabs or other injuries.
- Tear apart and throw away plastic packaging bags so that children will not play with them. If children play with a plastic bag which was not torn apart, they face the risk of suffocation.

Cautions before the test run

⚠ CAUTION

Turn on the power at least 12 hours before starting operation.

- Starting operation immediately after turning on the main power switch can result in severe damage to internal parts. Keep the power switch turned on during the operational season.

Do not touch the switches with wet fingers.

- Touching a switch with wet fingers can cause an electric shock.

Do not touch the refrigerant pipes during and immediately after operation.

- During and immediately after operation, the refrigerant pipes may be hot or cold, depending on the condition of the refrigerant flowing through the refrigerant piping, compressor, and other refrigerant cycle parts. Your hands may suffer burns or frost-bite if you touch the refrigerant pipes.

Do not operate the air conditioner with the panels and guards removed.

- Rotating, hot, or high-voltage parts can cause injuries.

Do not turn off the power immediately after stopping operation.

- Always wait at least five minutes before turning off the power. Otherwise, water leakage and trouble may occur.

Indoor Units

CRNN-TC
Ceiling Mounted Cassette Type (1Way)

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1. Specifications

Model		Unit	CRNN076TCA0	CRNN096TCA0	CRNN126TCA0
Cooling Capacity		W	2,100	2,600	3,500
		kcal/h	1,806	2,235	3,009
		Btu/h	7,165	8,871	11,942
Heating Capacity		W	2,363	2,925	3,938
		kcal/h	2,031	2,515	3,385
		Btu/h	8,061	9,980	13,435
Casing			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions (W*H*D)		mm	860*390*180	860*390*180	860*390*180
		inch	33.8*15.3*7.0	33.8*15.3*7.0	33.8*15.3*7.0
Coil	Rows x Columns x FPI		2 x 12 x 18	2 x 12 x 21	2 x 12 x 21
	Face Area	m^2	0.184	0.184	0.184
Moisture removal		l/h.	1.0	1.0	1.5
Fan	Type		Cross Flow Fan	Cross Flow Fan	Cross Flow Fan
	Motor Output x Number	W	14 x 1	14 x 1	14 x 1
	Air Flow Rate(H/M/L)	cmm	6/5/4	7/6/5	10/9/8
		cfm	225/197/168	246/216/195	353/317/283
	Drive		Direct	Direct	Direct
	Speed Control		Phase Control	Phase Control	Phase Control
Temperature Control			Microprocessor, Thermostat for cooling and heating		
Sound Absorbing Thermal Insulation Material			Foamed polystyrene	Foamed polystyrene	Foamed polystyrene
Safety Device			Fuse, Thermal Fuse for Fan Motor	Fuse, Thermal Fuse for Fan Motor	Fuse, Thermal Fuse for Fan Motor
Pipe Connections	Liquid Side	mm(inch)	6.35 (1/4)	6.35 (1/4)	6.35 (1/4)
	Gas Side	mm(inch)	12.7 (1/2)	12.7 (1/2)	12.7 (1/2)
	Drain Pipe(Internal Dia.)	mm	25	25	25
Net Weight		kg(lbs)	17(37.5)	17(37.5)	17(37.5)
Noise Level (Sound Press,1.5m, H/M/L)		dB±3	35/32/29	37/34/31	39/36/35
Power Supply		Ø,V,Hz	1,220~240,50	1,220~240,50	1,220~240,50
Power Cable		AWG#:P*mm^2	12:3*2.5	12:3*2.5	12:3*2.5
Refrigerant Control			L.E.V	L.E.V	L.E.V
Decoration Panel	Panel Color		White	White	White
	Dimensions (W*H*D)	mm	1050*480*30	1050*480*30	1050*480*30
		inch	41.3*18.9*1.2	41.3*18.9*1.2	41.3*18.9*1.2
Standard Accessories			Owner Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers, Positioning Jig for Installation, Insulation for Hanger Bracket, Air Outlet Blocking Pad.		

Notes:-

1. Capacities are based on the following conditions:
   - Cooling: - Indoor Temperature 27°C(80.6°F) DB /19°C(66.2°F) WB
     - Outdoor Temperature 35°C(95°F) DB /24°C(75.2°F) WB
     - Interconnecting Piping Length 7.5m
     - Level Difference of Zero.
   - Heating: - Indoor Temperature 20°C(68°F) DB / 15°C(59°F) WB
     - Outdoor Temperature 7°C(44.6°F) DB / 6°C(42.8°F) WB
     - Interconnecting Piping Length 7.5 m
     - Level Difference of Zero.
2. Capacities are Net Capacities.
3. Due to our policy of innovation some specifications may be changed without notification.
4. L.E.V. : Linear Expansion Valve

Conversion Formula
kcal/h = kW x 860
Btu/h = kW x 3414
cfm = m^3/min x 35.3

2. Functions

Indoor Unit

- **Operation ON/OFF by Remote controller**
- **Sensing the Room Temperature** • Room temperature sensor. (Thermistor)
- **Room temperature control** • Maintains the room temperature in accordance with the Setting temperature
- **Starting Current Control** • Indoor fan is delayed for 5 seconds at the starting.
- **Time Delay Safety Control** • Restarting is inhibited for approx. 3 minutes.
- **Indoor Fan Speed Control** • Jet, High, Med, Low
- **Soft Dry Operation Mode** • Intermittent operation of fan at low speed.
- **Airflow Direction Control** • The louver can be set at swing up and down automatically.
- **Auto Restart** • Although the air-conditioner is turned off by a power failure, it is restarted automatically previous operation mode after power supply.
- **Deice (defrost) control (Heating)** • Both the indoor and outdoor fan stops during defrosting. • Hot start after defrost ends.
- **Hot-start Control (Heating)** • The indoor fan does not rotate until the evaporator piping temperature will be reached at 25°C.
- **Compact and light design** • To install a unit is very convenient because of smaller size than textile.
- **Low noise** • The most advanced low-noise design. • The adoption of turbo fan and round type heat exchanger give the quietest operation.
- **Long life filter** • Long life wrinkle(type) and washable and anti-bacteria filter is adopted.
- **High head Drain pump** • Built-in drain pump automatically drains water. • A standard drain-head height of up to 700mm is possible.
- **High-Ceiling corresponding Function** • According to the height of ceiling, the RPM of indoor fan motor is selected to increase air reaching distance.
- **Central Control(Optional)** • It is operating individually or totally by central control function.

3. Operation Details

(1) The function of main control

■ Time Delay Safety Control

• 5sec … Vertical louvers are delayed for 5 secs to be opened to prevent the frictional sound between louver and air flow.

• 30sec … The 4-way valve is ceased for 30sec. to prevent abnormal noise when the Heating operation is OFF or switched to the other operation mode while compress is off.
While compressor is running, it takes 3~5 seconds to switch.

■ Auto Swing Control

• This function is to swing the louver up and down automatically.

■ Air-Filter Checking Control

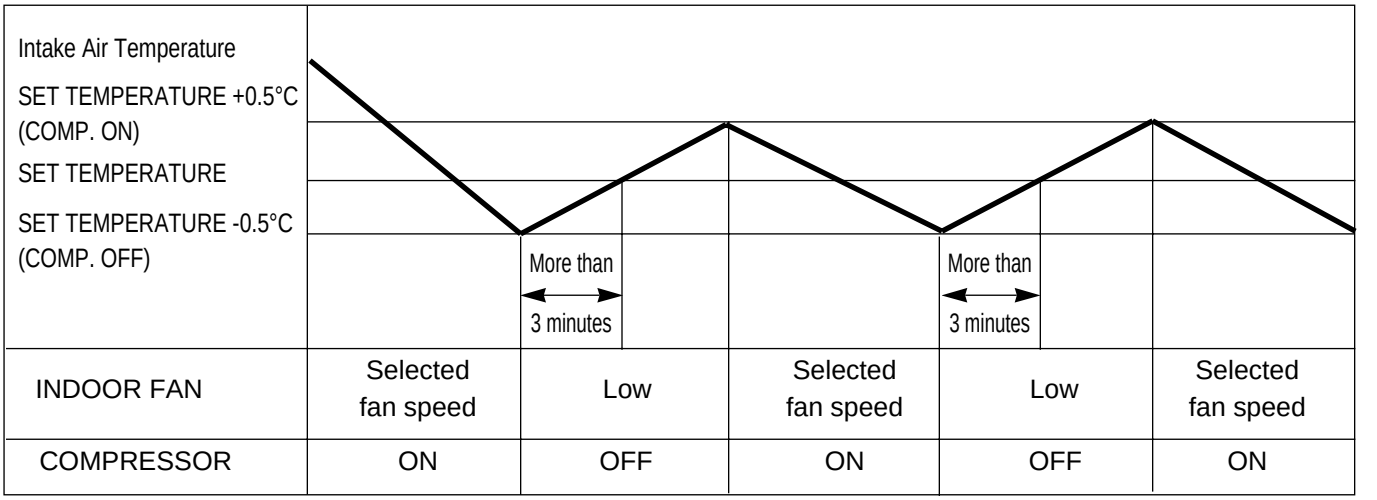
• 'Filter' sign will appear on the remote controller display and main body display when an air-filter is polluted. Then clean the air-filter referring to Owners Manual.

■ Soft-Dry Operation

• The indoor fan speed is automatically set to the low, and fan speed control is not available because of already being set to the best speed for Dry Operation by microcontroller control.

■ Cooling Mode Operation

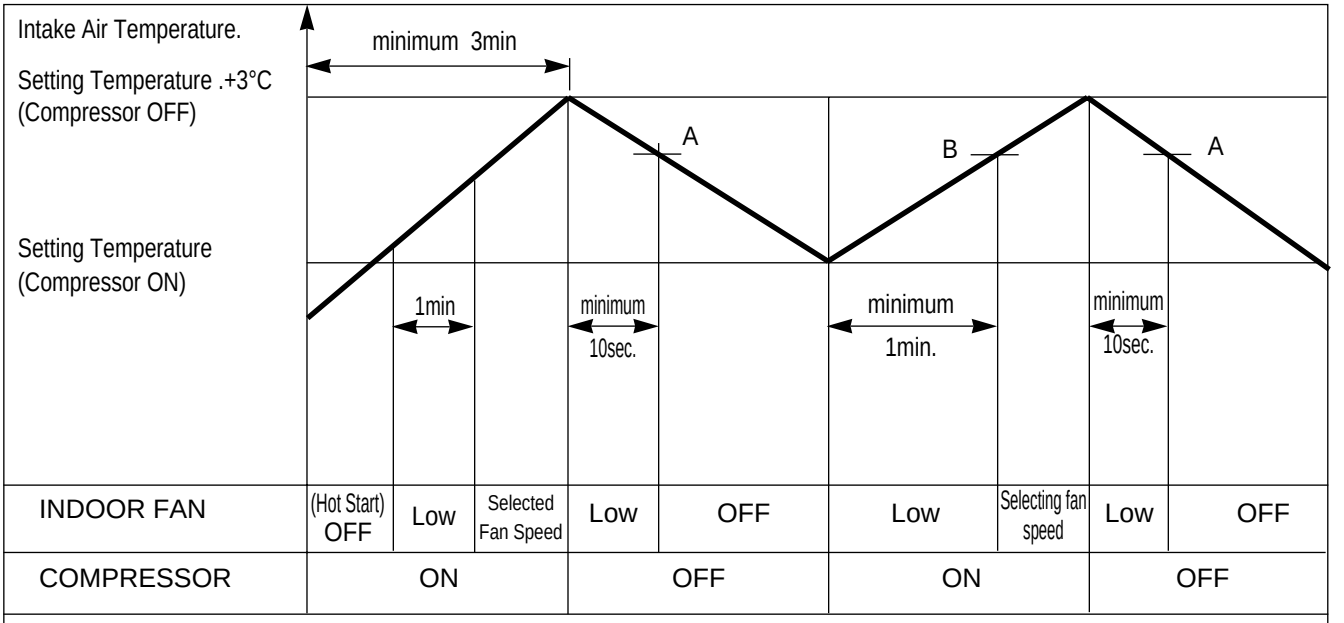
• When selecting the Cooling(❋) Mode Operation, the unit will operate according to the setting by the remote controller and the operation diagram is as follows.



INDOOR FAN	Selected fan speed	Low	Selected fan speed	Low	Selected fan speed
COMPRESSOR	ON	OFF	ON	OFF	ON

■ Heating Mode Operation

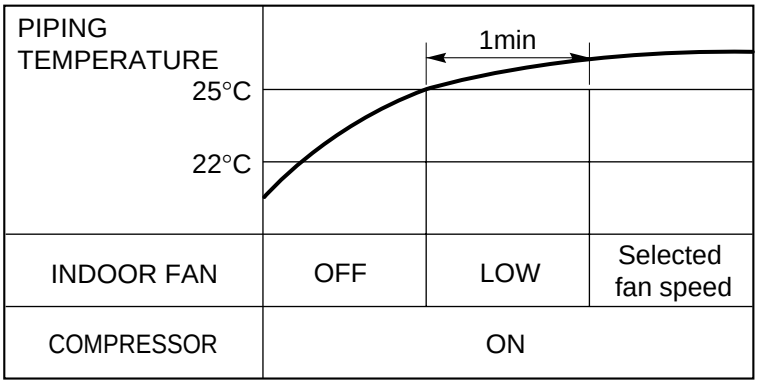
The unit will operate according to the setting by the remote controller and the operation diagram is shown as follows.



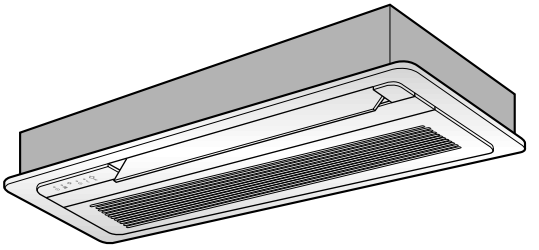
- A point; While the indoor Heat-Exchanger temperature is higher than 40°C fan operates at low speed, when it becomes lower than 40˚C fan stops.
- B point; When the indoor Heat-Exchanger temperature is higher than 42°C, fan operates at selected fan speed, when it becomes lower than 39°C, the fan operates at low speed.

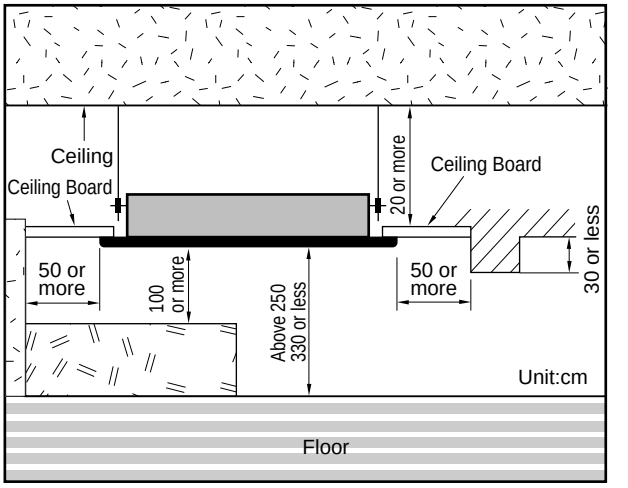
■ Hot-Start Control

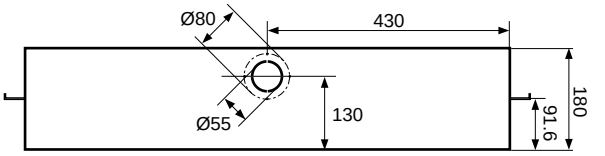
- The indoor fan sdoes not rotate until the evaporator piping temperature reaches to 25°C.
- If the evaporator piping temperature drops below 22°C, indoor fan stops again.
- The operation diagram is as follows.

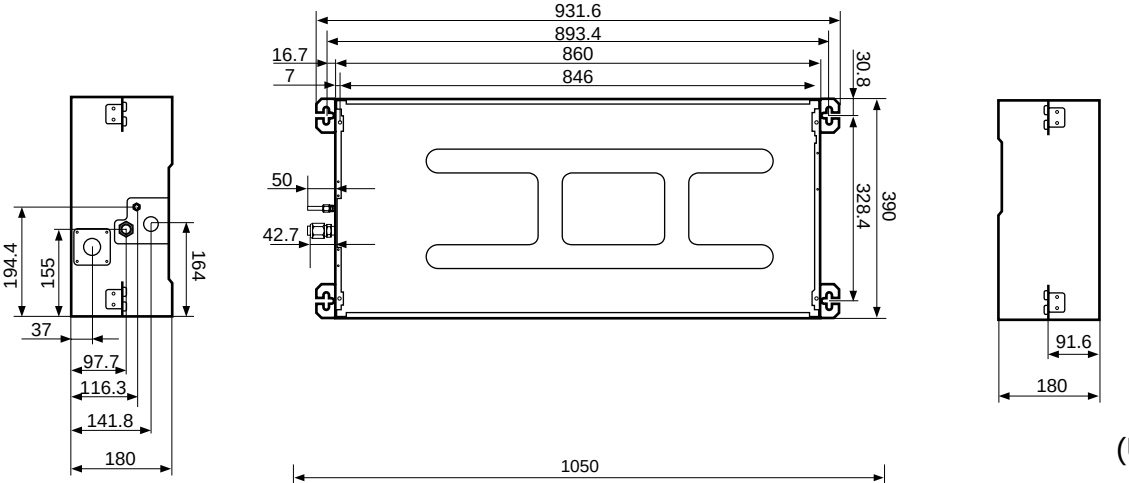


4. Dimensional Drawings

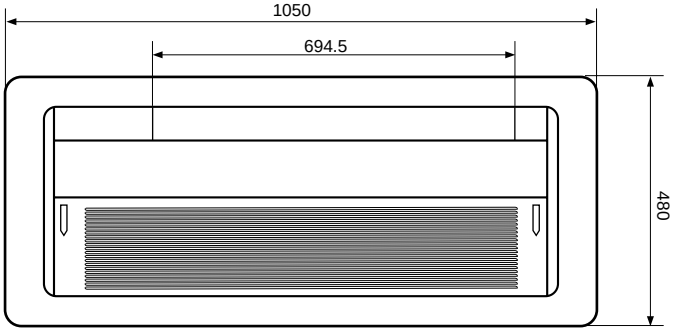




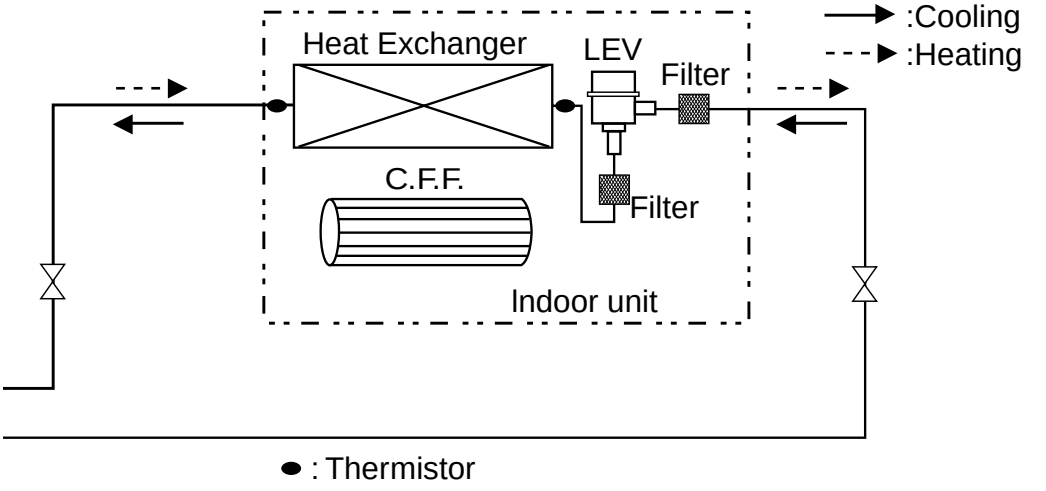




(Unit: mm)



5. Piping Diagrams

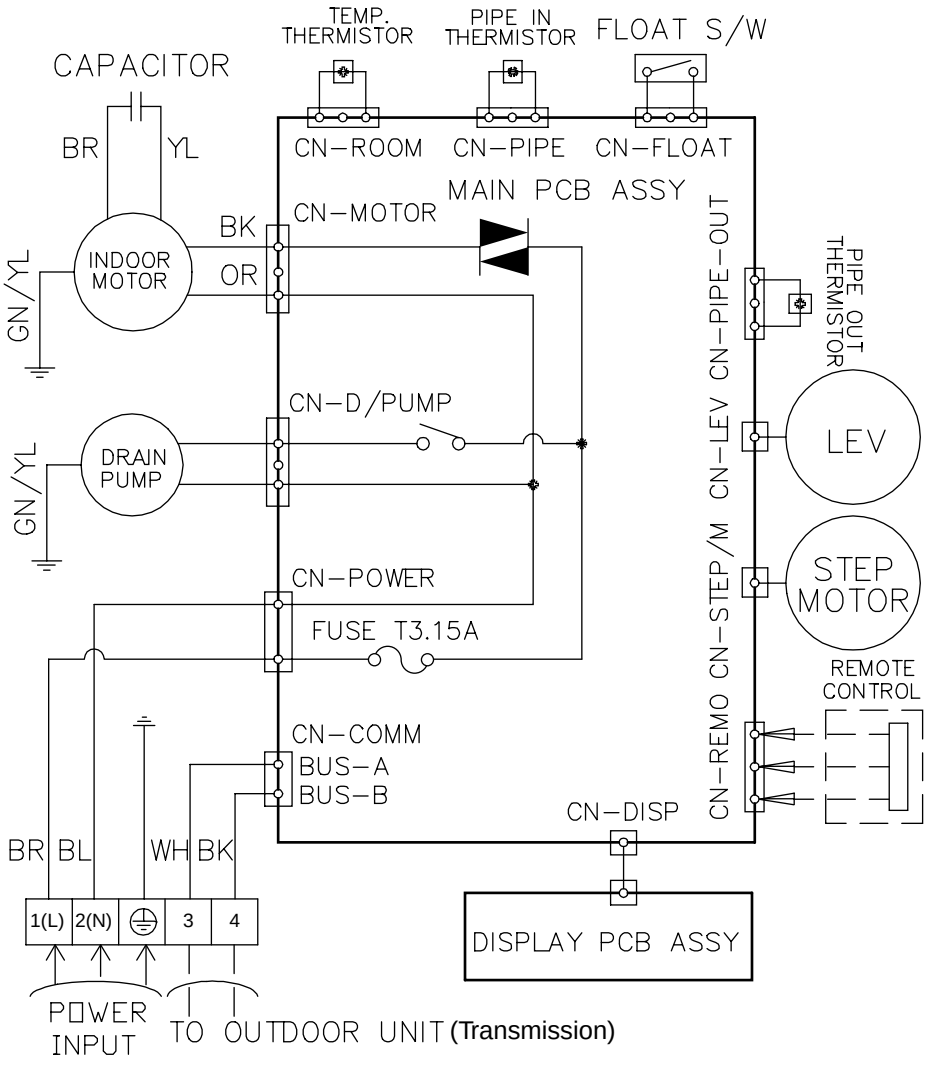


Refrigerant pipe connection port diameter

[unit: mm(inch)]

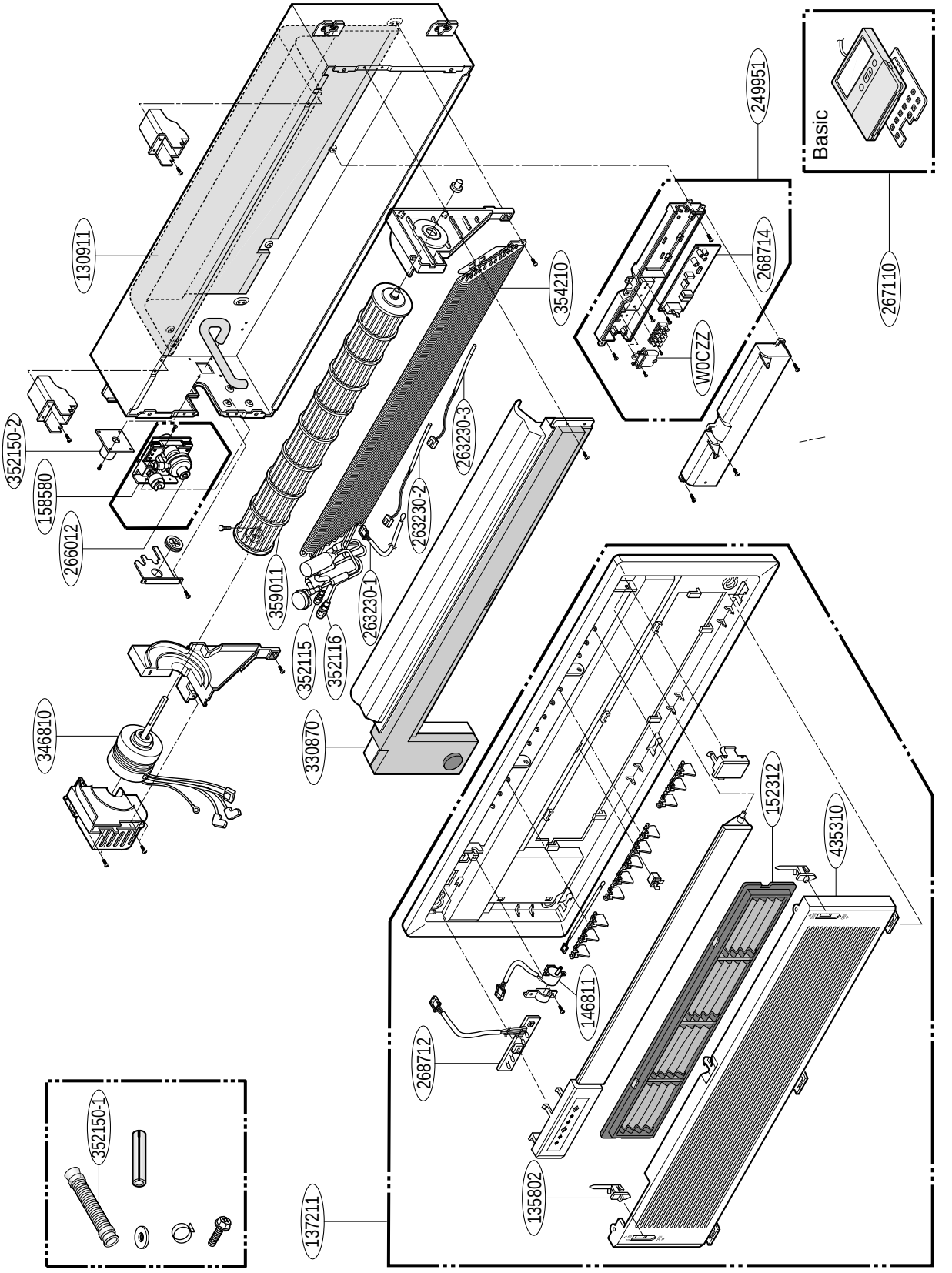
Model	Gas	Liquid
CRNN076TCA0	12.7(1/2)	6.35(1/4)
CRNN096TCA0		
CRNN126TCA0		

6. Wiring Diagrams



CONNECTOR NUMBER	SPEC	COLOR	DESCRIPTION
CN-POWER	AC POWER SUPPLY	WHITE	AC POWER LINE INPUT FOR INDOOR CONTROLLER
CN-MOTOR2	AC FAN MOTOR OUTPUT	YELLOW	MOTOR OUTPUT OF PHASE CONTROL
CN-D/PUMP	DRAIN PUMP OUTPUT	WHITE	AC OUTPUT FOR DRAIN PUMP
CN-COMM	COMMUNICATION	WHITE	COMMUNICATION BETWEEN INDOOR AND OUTDOOR
CN-DISP1	DISPLAY	WHITE	DISPLAY OF INDOOR STATUS
CN-LEV	LEV OUTPUT	WHITE	LEV CONTROL OUTPUT
CN-STEP/M1	STEP MOTOR	WHITE	STEP MOTOR OUTPUT
CN-FLOAT	FLOAT SWITCH INPUT	BLUE	FLOAT SWITCH SENSING
CN-PIPE	PIPE SENSOR	WHITE	PIPE THERMISTOR
CN-PIPE/O	DISCHARGE PIPE SENSOR	RED	DISCHARGE PIPE THERMISTOR
CN-ROOM	ROOM SENSOR	BLUE	ROOM THERMISTOR
CN-REMO	REMOTE CONTROLLER	WHITE	REMOTE CONTROL LINE
CN-AIRC	AIR CLEAN	WHITE	AIR CLEAN SIGNAL

7. Exploded View



8. Replacement Parts List

LOCATION No.	DESCRIPTION	PART No.			REMARK
		CRNN076TCA0	CRNN096TCA0	CRNN126TCA0	
130911	CABINET ASSEMBLY,INDOOR	3091A10024A			R
146811	MOTOR ASSEMBLY,STEP	4681AR2727G			R
152312	FILTER ASSEMBLY,AIR CLEANER	5231A10003A			R
158580	PUMP ASSEMBLY,WATER	5859A10001A			R
137211	PANEL ASSEMBLY,FRONT(INDOOR)	3721A10023Y			R
249951	CONTROL BOX ASSEMBLY,INDOOR	4995A10024Q	4995A10024R	4995A10024X	R
263230-1	THERMISTOR ASSEMBLY(ROOM)	6323AQ3214P			R
263230-2	THERMISTOR ASSEMBLY(PIPE-IN)	6323AQ3226E			R
263230-3	THERMISTOR ASSEMBLY(PIPE-OUT)	6323AQ3226V			R
266012	SWITCH ASSEMBLY,FLOAT	6601A20001E			R
267110	REMOTE CONTROLLER ASSEMBLY	6711A10002A			R
268712	PWB(PCB) ASSEMBLY,DISPLAY	6871A20096B			R
268714	PWB(PCB) ASSEMBLY,MAIN	6871A10089A	6871A10089B	6871A10089C	R
330870	DRAIN PAN ASSEMBLY	3087A10005A			R
346810	MOTOR ASSEMBLY,AC	4681A20003V			R
352115	TUBE ASSEMBLY,EVAPORATOR IN	5211A10303A			R
352116	TUBE ASSEMBLY,EVAPORATOR OUT	5211A20230D			R
354210	EVAPORATOR ASSEMBLY,FIRST	5421A10011B	5421A10011A	5421A10011A	R
359011	FAN ASSY,CROSS FLOW	5901AR2441A			R
435310	GRILLE ASSEMBLY,INLET	3531A10062D			R
W0CZZ	CAPACITOR,DRAWING	3H00671E			R
352150-1	DRAIN TUBE ASSEMBLY	5251AP2984A			R
352150-2	DRAIN ASSEMBLY,TUBE	5251A20001A			R

CRNN-TE / CRNN-TD
Ceiling Mounted Cassette Type (4Way)

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1. Specifications

Model		Unit	CRNN126TEA0	CRNN186TEA0	CRNN246TDA0
Cooling Capacity		W	3,500	5,300	7,000
		kcal/h	3,009	4,557	6,019
		Btu/h	11,942	18,084	23,885
Heating Capacity		Kw	3,938	5,963	7,875
		kcal/h	3,385	5,127	6,771
		Btu/h	13,435	20,345	26,870
Casing			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions (W*H*D)		mm	570*570*269	570*570*269	840*840*288
		inch	22.4*22.4*10.5	22.4*22.4*10.5	33.0*33.0*11.3
Coil	Rows x Columns x FPI		2*11*19	2*11*21	2*12*21
	Face Area	m^2	0.274	0.274	2*0.22
Moisture removal		l/h.	1.0	1.9	4.02
Fan	Type		Turbo Fan	Turbo Fan	Turbo Fan
	Motor Output x Number	W	20	22.4	52.5
	Air Flow Rate(H/M/L)	cmm	11 / 10 / 9	13 / 12 / 10	19 / 17 / 15
		cfm	353/317/283	459/423/353	670/600/530
	Drive		Direct	Direct	Direct
	Speed Control		Phase control	Phase control	Phase control
Temperature Control			Microprocessor, Thermostat for cooling and heating		
Sound Absorbing Thermal Insulation Material			Foamed polystyrene	Foamed polystyrene	Foamed polystyrene
Safety Device			Fuse, Thermal Fuse for Fan Motor	Fuse, Thermal Fuse for Fan Motor	Fuse, Thermal Fuse for Fan Motor
Pipe Connections	Liquid Side	mm(inch)	6.35 (1/4)	9.52 (3/8)	9.52 (3/8)
	Gas Side	mm(inch)	12.7 (1/2)	15.88 (5/8)	15.88 (5/8)
	Drain Pipe(Internal Dia.)	mm	25	25	25
Net Weight		kg(lbs)	19(41.9)	19(41.9)	32(70.5)
Noise Level (Sound Press,1.5m, H/M/L)		dB±3	38 / 35 / 32	41 / 39 / 37	36 / 34 / 32
Power Supply		Ø,V,Hz	1,220~240,50	1,220~240,50	1,220~240,50
Power Cable		AWG#:P*mm^2	12:3*2.5	12:3*2.5	12:3*2.5
Refrigerant Control			L.E.V	L.E.V	L.E.V
Decoration Panel	Panel Color		White	White	White
	Dimensions (W*H*D)	mm	670*670*30	670*670*30	950*950*30
		inch	26.4*26.4*1.2	26.4*26.4*1.2	37.4*37.4*1.2
Standard Accessories			Owner Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Washer fixing Plate, Sealing Pads, Clamps, Screws, Washer for Hanging Bracket, Insulation for Fitting		

Notes:-

1. Capacities are based on the following conditions:
   - Cooling: - Indoor Temperature 27°C(80.6°F) DB /19°C(66.2°F) WB
     - Outdoor Temperature 35°C(95°F) DB /24°C(75.2°F) WB
     - Interconnecting Piping Length 7.5m
     - Level Difference of Zero.
   - Heating: - Indoor Temperature 20°C(68°F) DB / 15°C(59°F) WB
     - Outdoor Temperature 7°C(44.6°F) DB / 6°C(42.8°F) WB
     - Interconnecting Piping Length 7.5 m
     - Level Difference of Zero.
2. Capacities are Net Capacities.
3. Due to our policy of innovation some specifications may be changed without notification.
4. L.E.V. : Linear Expansion Valve

Conversion Formula
kcal/h = kW x 860
Btu/h = kW x 3414
cfm = m^3/min x 35.3

Model		Unit	CRNN286TDA0	CRNN366TDA0	CRNN426TDA0	CRNN486TDA0
Cooling Capacity		W	8,200	10,600	12,300	14,100
		kcal/h	7,052	9,116	10,578	12,126
		Btu/h	27,995	36,168	41,992	48,137
Heating Capacity		W	9,225	11,925	13,838	15,863
		kcal/h	7,934	10,253	11,040	13,156
		Btu/h	31,494	40,689	43,829	54,156
Casing			Galvanized Steel Plate			
Dimensions (W*H*D)		mm	840*840*288	840*840*288	840*840*288	840*840*288
		inch	33.0*33.0*11.3	33.0*33.0*11.3	33.0*33.0*11.3	33.0*33.0*11.3
Coil	Rows x Columns x FPI		2*11*21	2*11*21	2*11*21	2*11*21
	Face Area	m^2	2*0.26	2*0.26	2*0.26	2*0.26
Moisture removal		l/h.	4.2	5.0	5.2	5.5
Fan	Type		Turbo Fan	Turbo Fan	Turbo Fan	Turbo Fan
	Motor Output x Number	W	52.5	52.5	52.5	52.5
	Air Flow Rate(H/M/L)	cmm	21 / 19 / 17	25 / 23 / 21	27 / 25 / 22	30 / 28 / 26
		cfm	741/670/600	883/812/742	953/883/777	1,059/988/918
	Drive		Direct			
	Speed control		Phase control			
Temperature Control			Microprocessor, Thermostat for cooling and heating			
Sound Absorbing Thermal Insulation Material			Foamed polystyrene			
Safety Device			Fuse, Thermal Fuse for Fan Motor			
Pipe Connections	Liquid Side	mm(inch)	9.52 (3/8)	9.52 (3/8)	9.52 (3/8)	9.52 (3/8)
	Gas Side	mm(inch)	15.88 (5/8)	19.05(3/4)	19.05(3/4)	19.05(3/4)
	Drain Pipe(Internal Dia.)	mm	25	25	25	25
Net Weight		kg(lbs)	32(70.5)	32(70.5)	32(70.5)	32(70.5)
Noise Level (Sound Press,1.5m, H/M/L)		dBA±3	42/40/38	43/41/39	44/42/40	45/43/41
Power Supply		Ø,V,Hz	1,220~240,50	1,220~240,50	1,220~240,50	1,220~240,50
Power Cable		AWG#:P*mm^2	12:3*2.5	12:3*2.5	12:3*2.5	12:3*2.5
Refrigerant Control			L.E.V	L.E.V	L.E.V	L.E.V
Decoration Panel	Panel Color		White	White	White	White
	Dimensions (W*H*D)	mm	950*950*30	950*950*30	950*950*30	950*950*30
		inch	37.4*37.4*1.2	37.4*37.4*1.2	37.4*37.4*1.2	37.4*37.4*1.2
Standard Accessories			Owner Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Washer fixing Plate, Sealing Pads, Clamps, Screws, Washer for Hanging Bracket, Insulation for Fitting			

Notes:-

1. Capacities are based on the following conditions:
   - Cooling: - Indoor Temperature 27°C(80.6°F) DB /19°C(66.2°F) WB
     - Outdoor Temperature 35°C(95°F) DB /24°C(75.2°F) WB
     - Interconnecting Piping Length 7.5m
     - Level Difference of Zero.
   - Heating: - Indoor Temperature 20°C(68°F) DB / 15°C(59°F) WB
     - Outdoor Temperature 7°C(44.6°F) DB / 6°C(42.8°F) WB
     - Interconnecting Piping Length 7.5 m
     - Level Difference of Zero.
2. Capacities are Net Capacities.
3. Due to our policy of innovation some specifications may be changed without notification.
4. L.E.V. : Linear Expansion Valve

Conversion Formula
kcal/h = kW x 860
Btu/h = kW x 3414
cfm = m^3/min x 35.3

2. Functions

Indoor Unit

- **Operation ON/OFF by Remote controller**
- **Sensing the Room Temperature** • Room temperature sensor. (Thermistor)
- **Room temperature control** • Maintains the room temperature in accordance with the Setting Temperature.
- **Starting Current Control** • Indoor fan is delayed for 5 seconds at the starting.
- **Time Delay Safety Control** • Restarting is inhibited for approx. 3 minutes.
- **Indoor Fan Speed Control** • Jet, High, Med, Low
- **Soft Dry Operation Mode** • Intermittent operation of fan at low speed.
- **Airflow Direction Control** • The louver can be set at swing up and down automatically.
- **Auto Restart** • Although the air-conditioner is turned off by a power failure, it is restarted automatically previous operation mode after power supply.
- **Deice (defrost) control (Heating)** • Both the indoor and outdoor fan stops during defrosting. • Hot start after defrost ends.
- **Hot-start Control (Heating)** • The indoor fan does not rotate until the evaporator piping temperature will be reached at 25°C.
- **Compact and light design** • To install a unit is very convenient because of smaller size than textile.
- **Low noise** • The most advanced low-noise design. • The adoption of turbo fan and round type heat exchanger give the quietest operation.
- **Long life filter** • Long life wrinkle(type) and washable and anti-bacteria filter is adopted.
- **High head Drain pump** • Built-in drain pump automatically drains water. • A standard drain-head height of up to 700mm is possible.
- **High-Ceiling corresponding Function** • According to the height of ceiling, the RPM of indoor fan motor is selected to increase air reaching distance.
- **Central Control(Optional)** • It is operating individually or totally by central control function.

3. Operation detail

(1) The function of main control

■ Time Delay Safety Control

• 5 sec··· Vertical air flow direction control louvers open in 5 seconds to prevent noise between louvers and wind.

• 5 sec··· The 4-way valve is ceased for 5 sec. to prevent the refrigerant-gas abnormal noise when the Heating operation is OFF or switched to the other operation mode when compress is off.
While compressor is running, it takes 3~5 seconds to switch.

■ Auto Swing Control

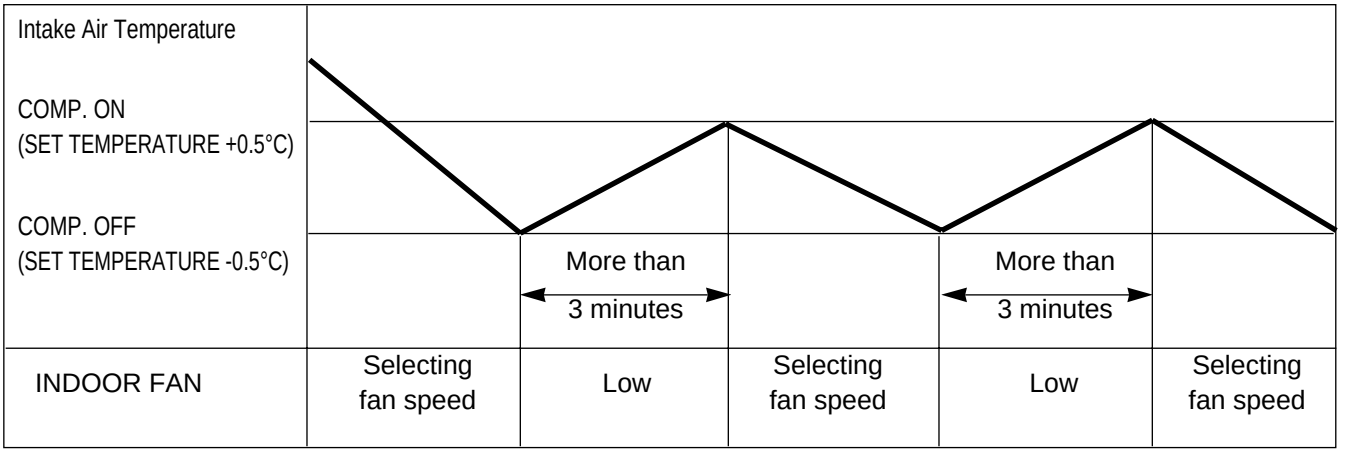
• This function is to swing the louver up and down automatically.

■ Soft-Dry Operation

• The indoor fan speed is automatically set to the low, so the shift of the indoor fan speed is impossible because of already being set to the best speed for Dry Operation by microcontroller control.

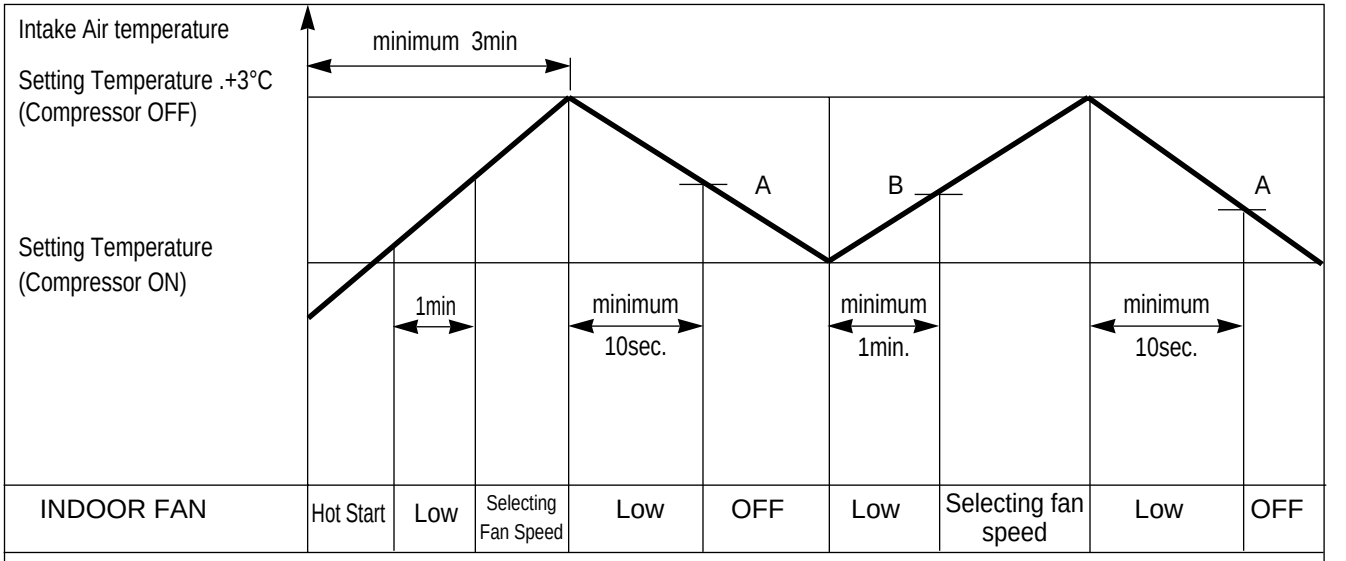
■ Cooling Mode Operation

• When selecting the Cooling(❄) Mode Operation, the unit will operate according to the setting by the remote controller and the operation diagram is as following



■ Heating Mode Operation

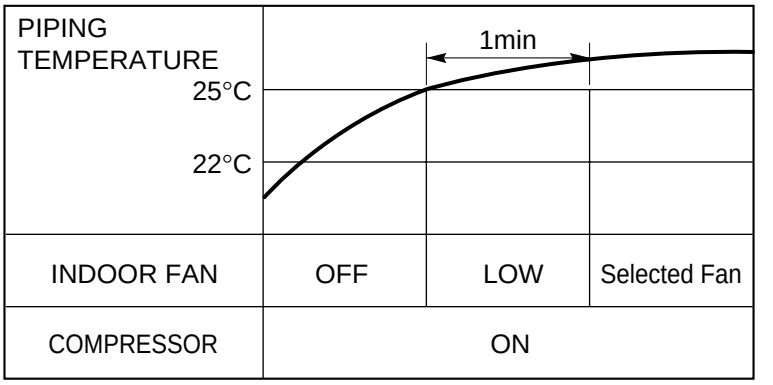
The unit will operate according to the setting by the remote controller and the operation diagram is shown as following.



- A point; While the indoor Heat-Exchanger temperature is higher than 40°C fan operates at low speed, when it becomes lower than 40˚C fan stops.
- B point; When the indoor Heat-Exchanger temperature is higher than 31°C, fan operates at selected fan speed, when it becomes lower than 31°C, the fan operates at low speed for 10sec, after 10sec, it operates at selected fan speed.

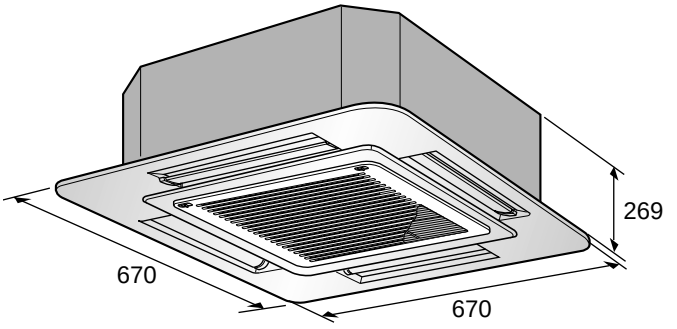
■ Hot-start Control

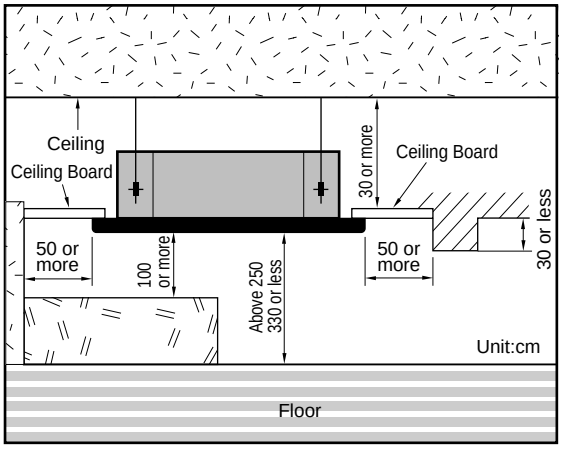
- The indoor fan does no rotate until the evaporator piping temperature will be reached to 25°C.
- The operation diagram is as following.

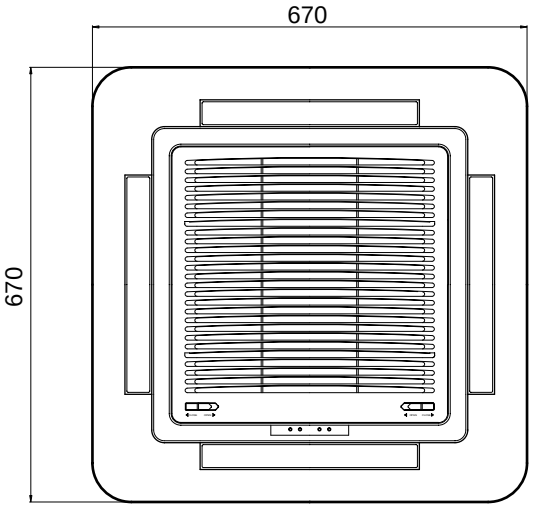


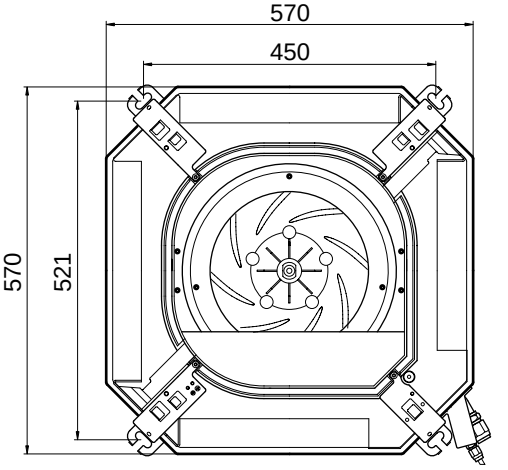
4. Dimensional Drawings

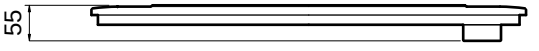
CRNN126TEA0, CRNN186TEA0,

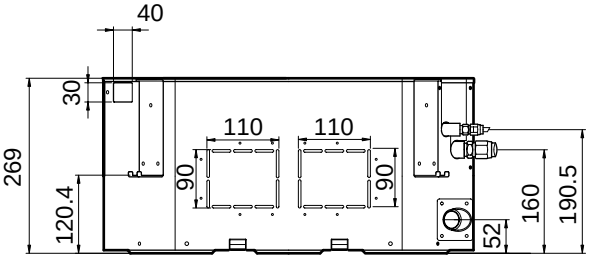






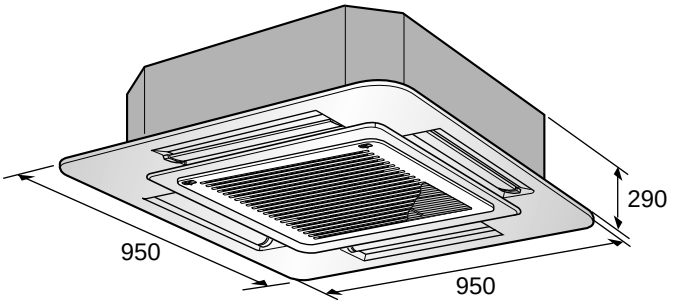


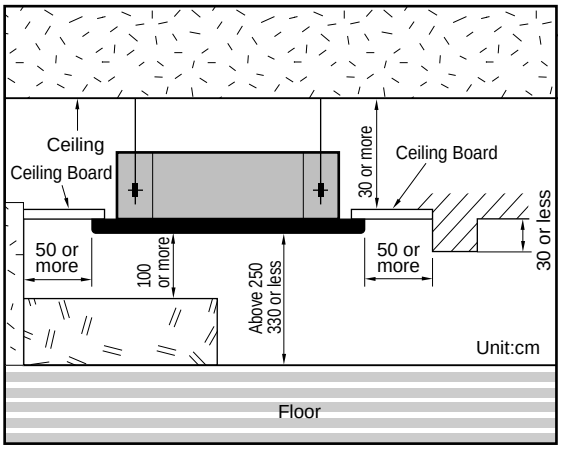


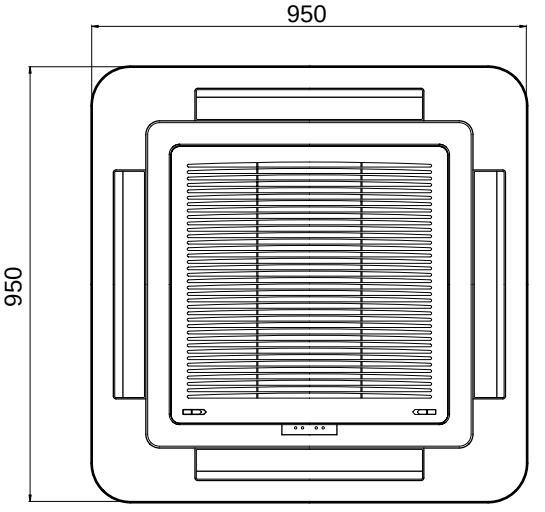


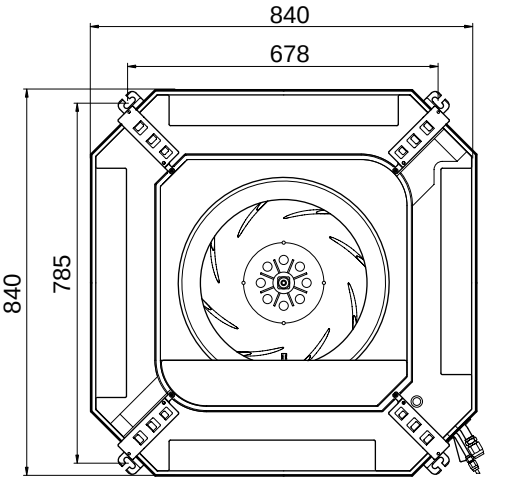
(unit:mm)

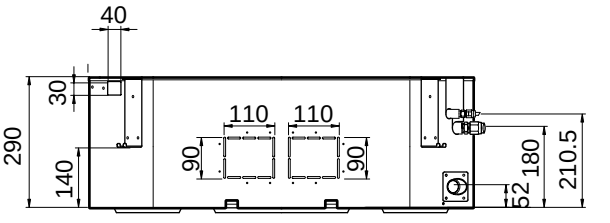
CRNN246TDA0, CRNN286TDA0, CRNN366TDA0
CRNN426TDA0, CRNN486TDA0





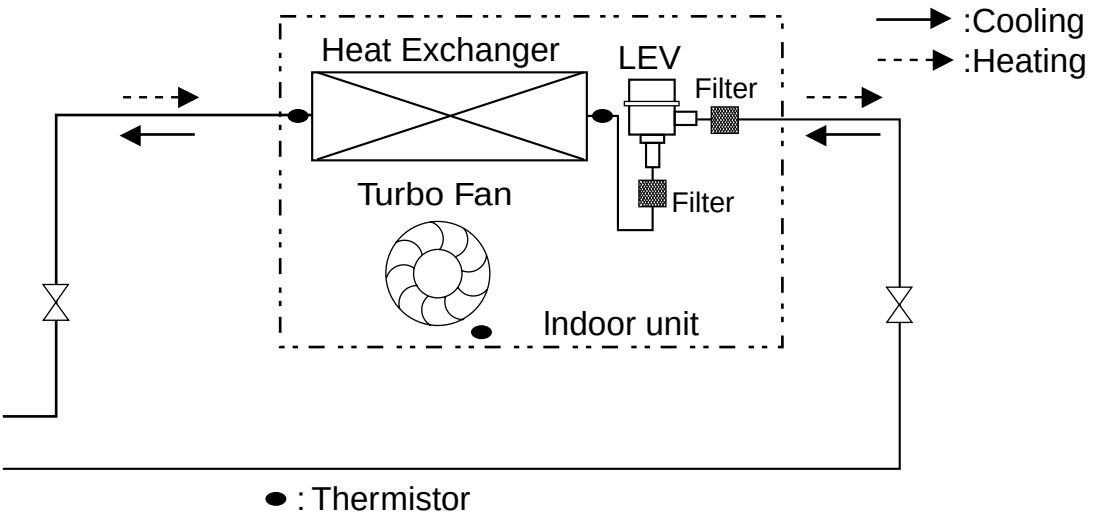






(unit:mm)

5. Piping Diagrams

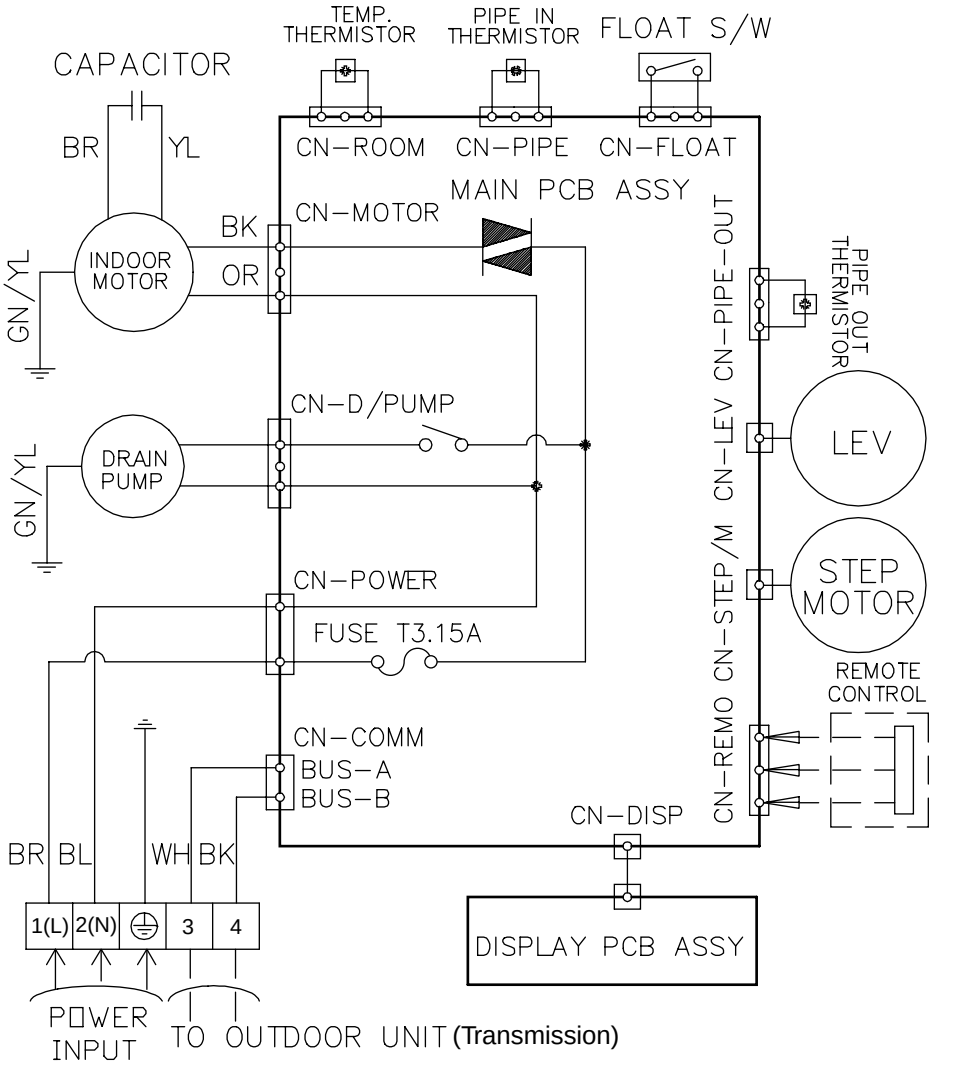


Refrigerant pipe connection port diameter

[unit: mm(inch)]

Model	Gas	Liquid
CRNN126TEA0	12.7(1/2)	6.35(1/4)
CRNN186TEA0	15.88(5/8)	9.52(3/8)
CRNN246TDA0	15.88(5/8)	9.52(3/8)
CRNN286TDA0	15.88(5/8)	9.52(3/8)
CRNN366TDA0	19.05(3/4)	9.52(3/8)
CRNN426TDA0	19.05(3/4)	9.52(3/8)
CRNN486TDA0	19.05(3/4)	9.52(3/8)

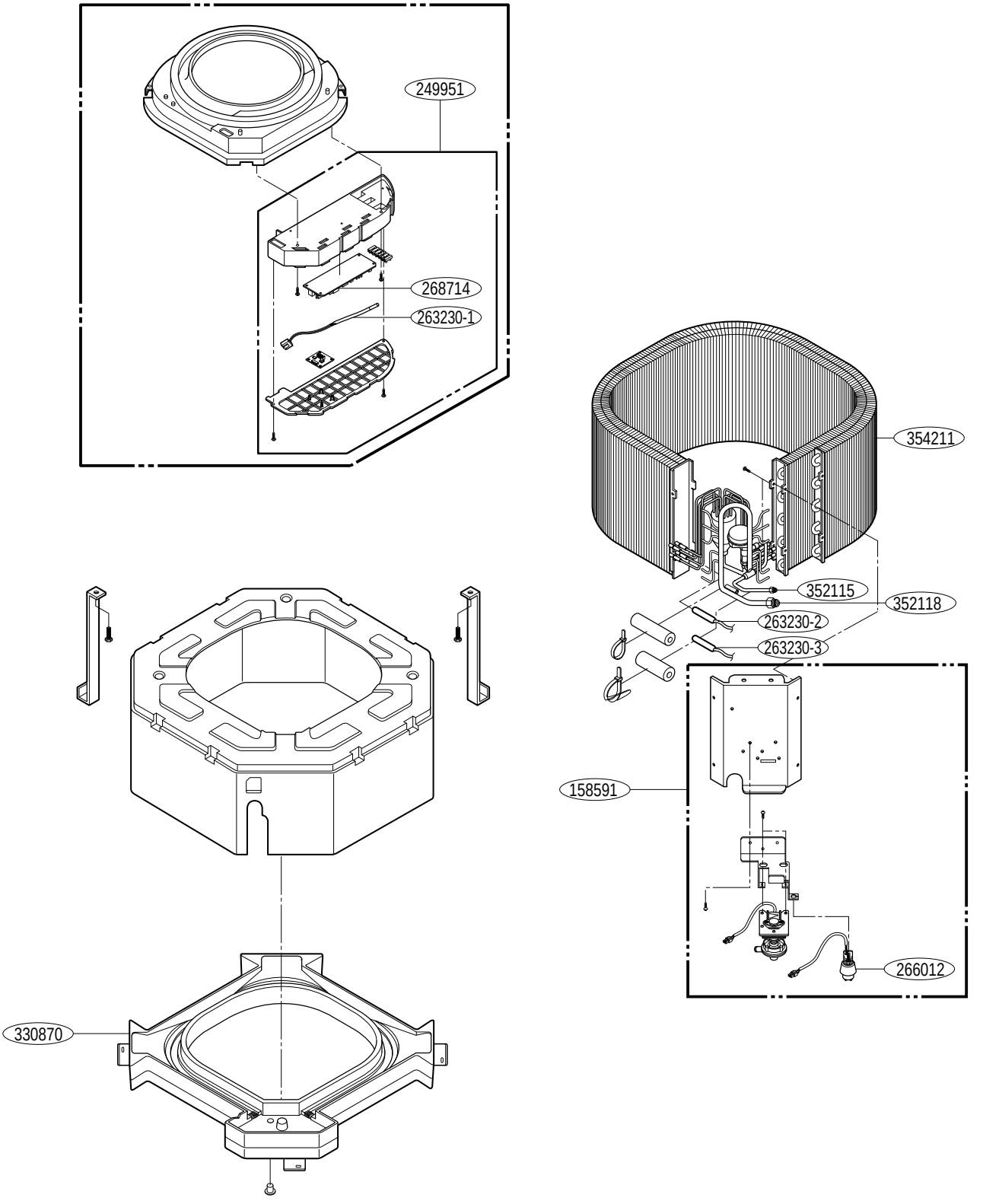
6. Wiring Diagrams

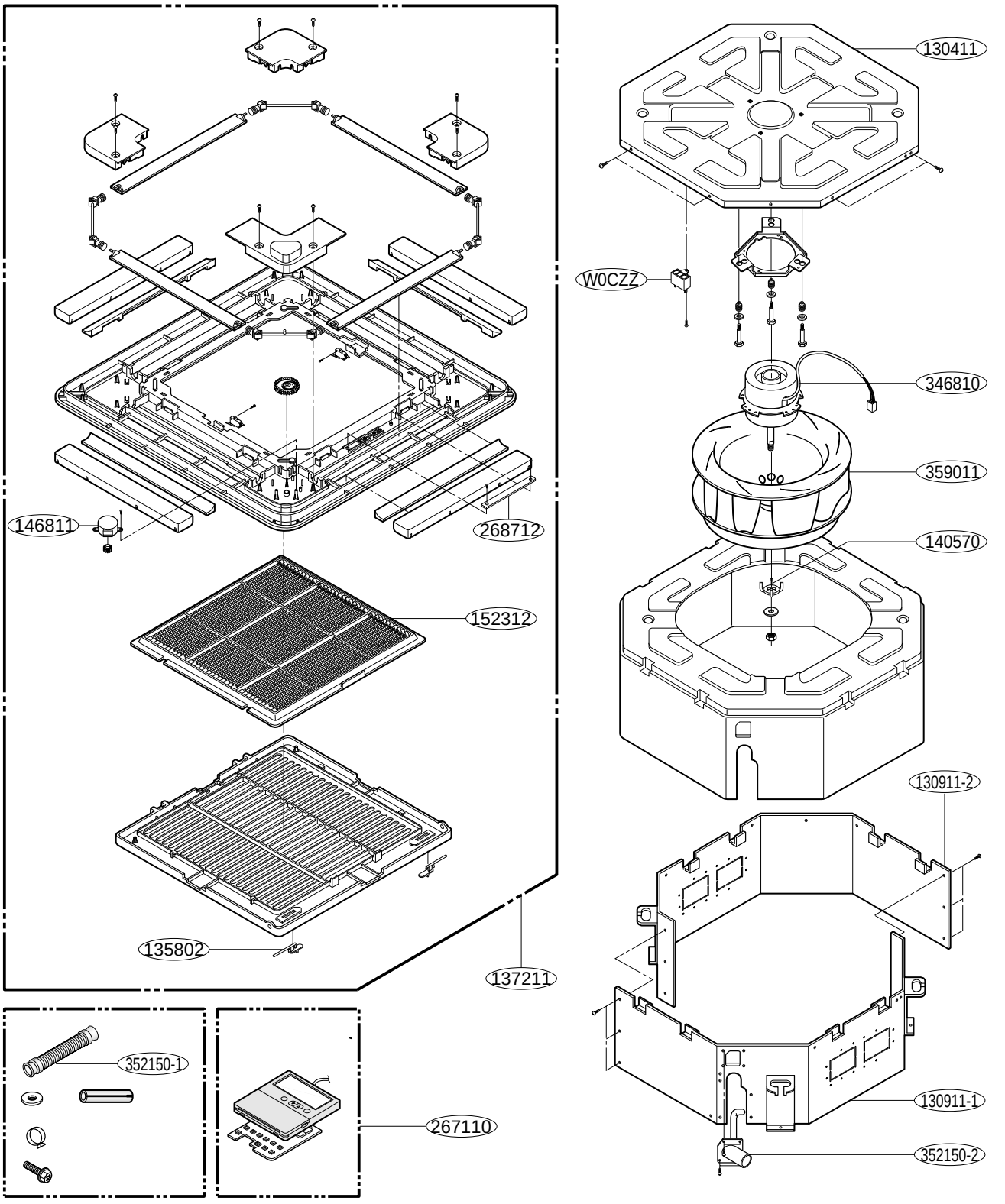


CONNECTOR NUMBER	SPEC	COLOR	DESCRIPTION
CN-POWER	AC POWER SUPPLY	WHITE	AC POWER LINE INPUT FOR INDOOR CONTROLLER
CN-MOTOR2	AC FAN MOTOR OUTPUT	YELLOW	MOTOR OUTPUT OF PHASE CONTROL
CN-D/PUMP	DRAIN PUMP OUTPUT	WHITE	AC OUTPUT FOR DRAIN PUMP
CN-COMM	COMMUNICATION	WHITE	COMMUNICATION BETWEEN INDOOR AND OUTDOOR
CN-DISP1	DISPLAY	WHITE	DISPLAY OF INDOOR STATUS
CN-LEV	LEV OUTPUT	WHITE	LEV CONTROL OUTPUT
CN-STEP/M1	STEP MOTOR	WHITE	STEP MOTOR OUTPUT
CN-FLOAT	FLOAT SWITCH INPUT	BLUE	FLOAT SWITCH SENSING
CN-PIPE	PIPE SENSOR	WHITE	PIPE THERMISTOR
CN-PIPE/O	DISCHARGE PIPE SENSOR	RED	DISCHARGE PIPE THERMISTOR
CN-ROOM	ROOM SENSOR	BLUE	ROOM THERMISTOR
CN-REMO	REMOTE CONTROLLER	WHITE	REMOTE CONTROL LINE
CN-AIRC	AIR CLEAN	WHITE	AIR CLEAN SIGNAL

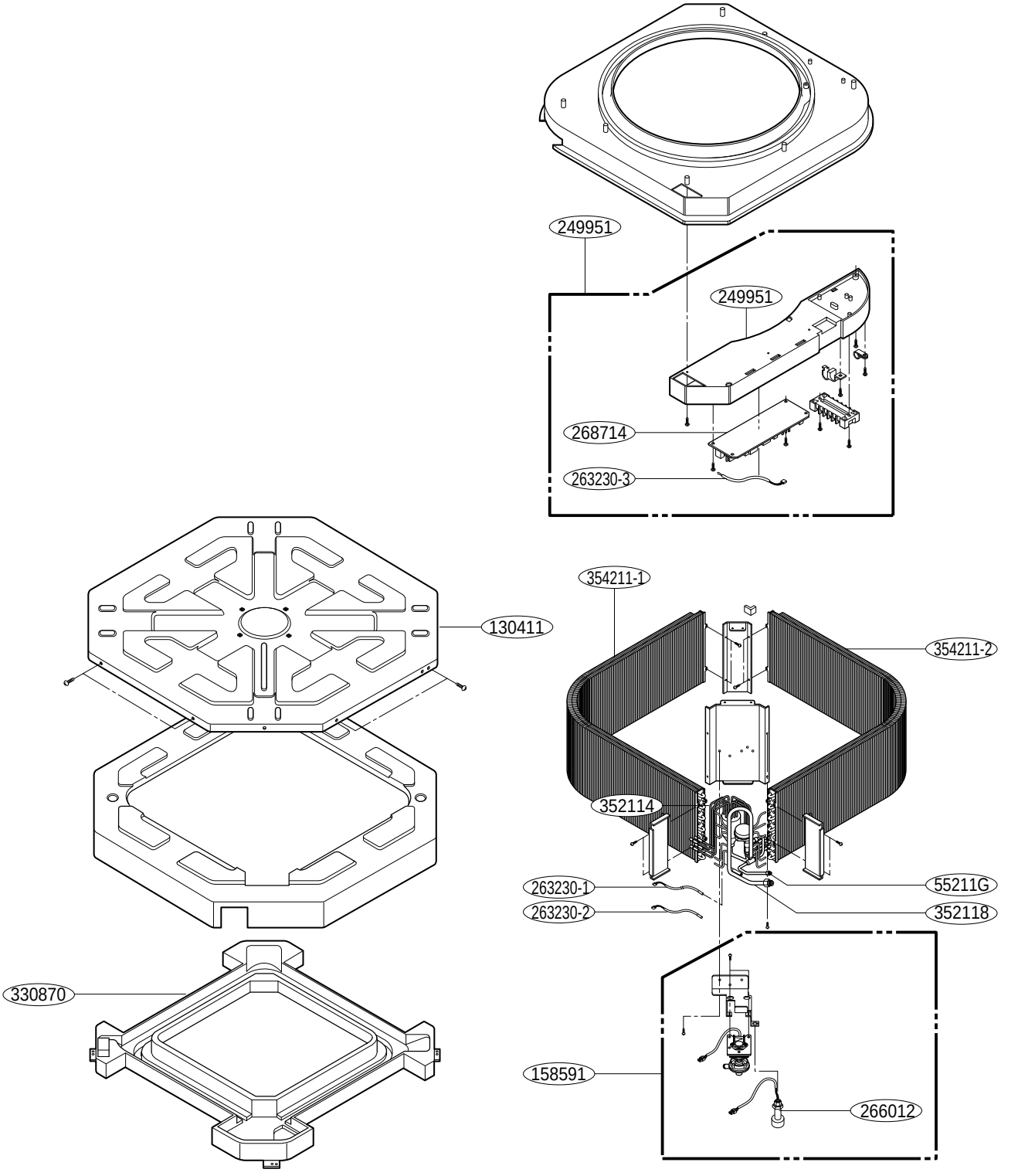
7. Exploded View

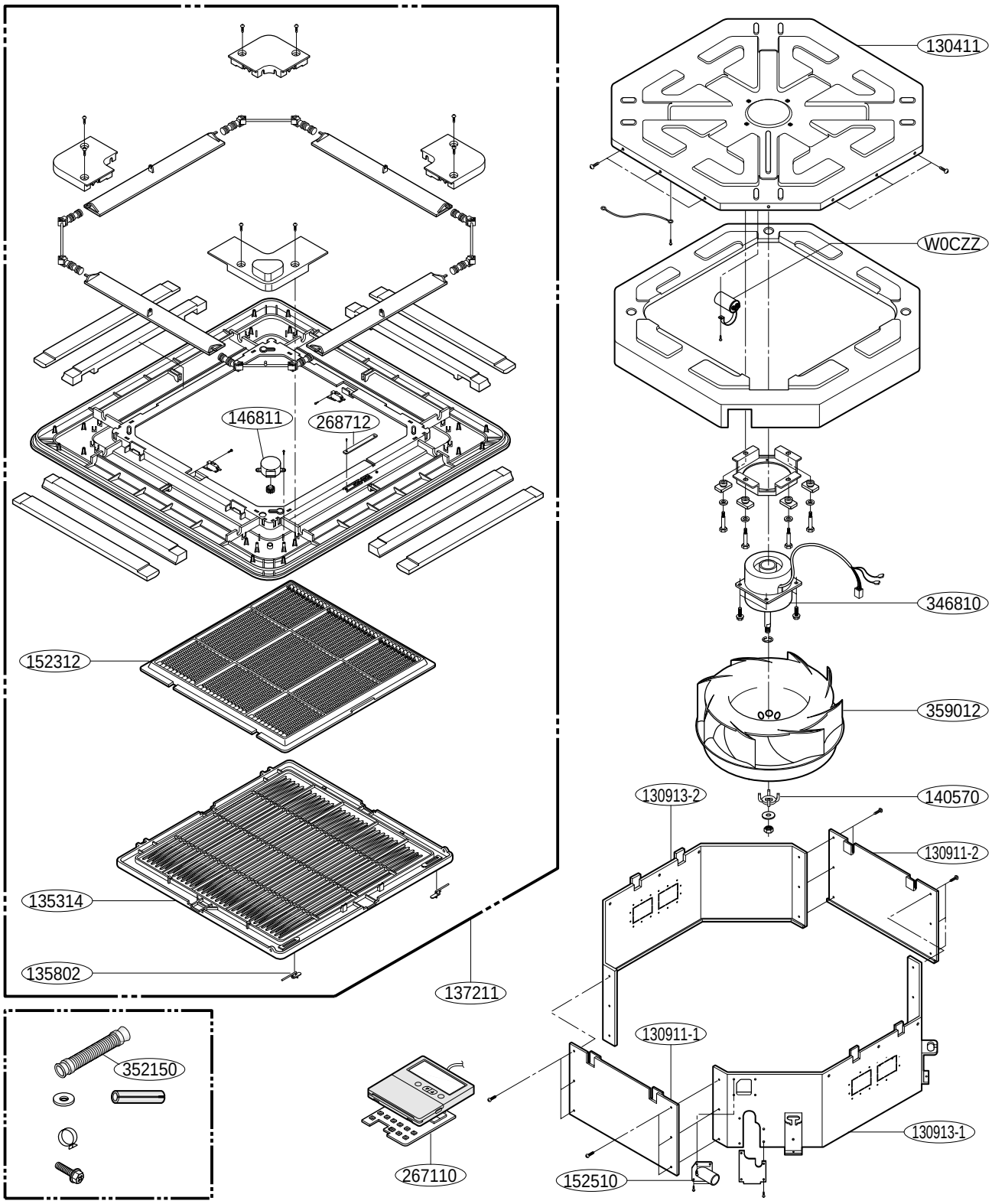
CRNN126TEA0, CRNN186TEA0




130411
W0CZZ
346810
359011
140570
130911-2
130911-1
352150-2
146811
268712
152312
135802
137211
352150-1
267110

CRNN246TDA0, CRNN286TDA0, CRNN366TDA0, CRNN426TDA0, CRNN486TDA0




130411
W0CZZ
146811
268712
346810
152312
359012
130913-2
140570
130911-2
135314
135802
137211
130911-1
352150
130913-1
267110
152510

8. Replacement Parts List

LOCATION NO.	DESCRIPTION	PART NO.		REMARK
		CRNN126TEA0	CRNN186TEA0	
130411	BASE ASSY,WELD[INDOOR]	3041A10013A		R
130911-1	CABINET ASSEMBLY,INDOOR	3091A10023C		R
130911-2	CABINET ASSEMBLY,INDOOR	3091A10023D		R
135802	DOOR	3580A20005A		R
137211	PANEL ASSY,FRONT(INDOOR)	3721A10021A		R
140570	LOCKER	4056A20001A		R
146811	MOTOR ASSY,STEP	4681AP2968D		R
152312	FILTER ASSY,AIR CLEANER	5231A10005A		R
158591	PUMP ASSEMBLY,WATER	5859A20001H		R
249951	CONTROL BOX ASSEMBLY,INDOOR	4995A10083A	4995A10083B	R
263230-1	THERMISTOR ASSEMBLY(ROOM)	6323AQ3214B		R
263230-2	THERMISTOR ASSEMBLY(PIPE-IN)	6323A30002B		R
263230-3	THERMISTOR ASSEMBLY(PIPE-OUT)	6323AQ3226R		R
266012	SWITCH ASSY,FLOAT	6601A20001F		R
267110	REMOTE CONTROLLER ASSEMBLY	6711A10002A		R
268712	PWB(PCB) ASSY,DISPLAY	6871A20096C		R
268714	PWB(PCB) ASSEMBLY,MAIN	6871A10089D	6871A10089E	R
330870	DRAIN PAN ASSEMBLY	3087A10002A		R
346810	MOTOR ASSEMBLY,SINGLE	4681AC2026E	4681AC2026D	R
352115	TUBE ASSEMBLY,EVAPORATOR IN	5211A10335B	5211A10335A	R
352118	TUBE ASSEMBLY,MENIFOLD(INDOOR)	5211A20241N	5211A20241P	R
354211	EVAPORATOR ASSY,BENDING	5421A10006A	5421A10006B	R
359011	FAN,TURBO	5900A10004A		R
W0CZZ	CAPACITOR,DRAWING	3H00660N		R
352150-1	DRAIN TUBE ASSEMBLY	5251AP2984A		R
352150-2	DRAIN ASSEMBLY,TUBE	5251A20002A		R

LOCATION NO.	DESCRIPTION	PART NO.					REMARK
		CRNN246TDA0	CRNN286TDA0	CRNN366TDA0	CRNN426TDA0	CRNN486TDA0	
354211-1	EVAPORATOR ASSY	5421A10016A					R
354211-2	EVAPORATOR ASSY	5421A10016B					R
352118	TUBE ASSEMBLY, MENIFOLD (INDOOR)	5211A20251B					R
	TUBE ASSEMBLY, MENIFOLD (INDOOR)	5211A20251H		5211A20251G			R
352114	TUBE ASSEMBLY, DISTRIBUTOR	5211A10299A					R
55211G	TUBE ASSEMBLY, EXPANSION	5211A10298A					R
158591	PUMP ASSEMBLY, WATER	5859A20001D					R
266012	SWITCH ASSY, FLOAT	6601A20001F					R
330870	DRAIN PAN ASSY	3087A100006A					R
249951	CONTROL BOX ASSY	4995A20268X	4995A20268Y	4995A20268A	4995A20268Z	4995A10106L	R
268714	PWB(PCB) ASSY, MAIN	6871A10089F	F6871A10089G	6871A10089H	6871A10089S	6871A10089T	R
130411	BASE ASSY, WELD INDOOR	3041A10016A					R
346810	MOTOR ASSY, INDOOR	4681A20006J			4681A20006H		R
359012	FAN,TURBO	5900A10003B					R
140570	LOCKER	4056A20001B					R
130911-1	CABINET ASSY, INDOOR	3091A10031A					R
130911-2	CABINET ASSY, INDOOR	3091A10031B					R
130913-1	CABINET ASSEMBLY, WELD	3091A10030A					R
130913-2	CABINET ASSEMBLY, WELD	3091A10030B					R
152510	DRAIN ASSY, TUBE	5251A20002B					R
352150	DRAIN TUBE ASSY	5251AP2984A					R
137211	PANEL ASSY, FRONT(INDOOR)	3721A10025A					R
135314	GRILLE INLET	3530A10062A					R
146811	MOTOR ASSY, STEP	4681A20055A					R
268712	PWB(PCB) ASSY, DISPLAY	6871A20096C					R
152312	FILTER ASSY	5231A10004A					R
135802	DOOR LOCK	3580A20005A					R
267110	WIRED REMOTE CONTROLLER	6711A10002A					R
263230-1	THERMISTOR ASSY(PIPE-IN)	6323A30002A					R
263230-2	THERMISTOR ASSY(PIPE-OUT)	6323AQ3226T					R
263230-3	THERMISTOR ASSY(ROOM)	6323A30004C					R
W0CZZ	CAPACITOR	3H00660M			2A00986D		R

CRNN-BH / CRNN-BG / CRNN-BE
Ceiling Concealed Duct Type (High static)

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1. Specifi cations

Model		Unit	CRNN186BHA0	CRNN246BHA0	CRNN286BGA0
Cooling Capacity		W	5,300	7,000	8,200
		kcal/h	4,557	6,019	7,052
		Btu/h	18,084	23,885	27,995
Heating Capacity		W	5,963	7,875	9.255
		kcal/h	5,127	6,771	7,933
		Btu/h	20,345	26,870	31,494
Casing			Galvanized Steel Plate		
Dimensions (W*H*D)		mm	880*260*450	880*260*450	1,180*298*450
		inch	34.6*10.2*17.7	34.6*10.2*17.7	46.4*11.7*17.7
Coil	Rows x Columns x FPI		2*10*21	3*10*21	3*12*21
	Face Area	m^2	0.15	0.15	0.20
Moisture removal		*l*/h.	2.0	2.5	3.0
Fan	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output x Number	W	118	118	272
	Air Flow Rate(H/M/L)	cmm	16.5 / 14.5 / 13	18 / 16.5 / 14	30 / 27 / 25
		cfm	583 / 512 / 459	636 / 583 / 494	1,059 / 953 / 882
	External Static Pressure	Pa	78.5	58.8	78.5
	Drive		Direct		
	Speed control		Phase control		
Temperature Control			Microprocessor, Thermostat for cooling and heating		
Sound Absorbing Thermal Insulation Material			Foamed polystyrene		
Safety Device			Fuse, Thermal Fuse for Fan Motor		
Pipe Connections	Liquid Side	mm(inch)	9.52 (3/8)	9.52 (3/8)	9.52 (3/8)
	Gas Side	mm(inch)	15.88 (5/8)	15.88 (5/8)	15.88 (5/8)
	Drain Pipe(Internal Dia.)	mm	25	25	25
Net Weight		kg(lbs)	34(74.9)	35(77.2)	38(83.8)
Noise Level (Sound Press,1.5m, H/M/L)		dBA±3	36 / 34 / 32	38 / 35 / 32	40 / 38 / 36
Power Supply		Ø,V,Hz	1,220~240,50	1,220~240,50	1,220~240,50
Power Cable		AWG#:P*mm^2	12:3*2.5	12:3*2.5	12:3*2.5
Refrigerant Control			L.E.V	L.E.V	L.E.V
Standard Accessories			Owner Manual, Installation Manual, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws		

Notes:-

1. Capacities are based on the following conditions:
   - Cooling: - Indoor Temperature 27°C(80.6°F) DB /19°C(66.2°F) WB
     - Outdoor Temperature 35°C(95°F) DB /24°C(75.2°F) WB
     - Interconnecting Piping Length 7.5m
     - Level Difference of Zero.
   - Heating: - Indoor Temperature 20°C(68°F) DB / 15°C(59°F) WB
     - Outdoor Temperature 7°C(44.6°F) DB / 6°C(42.8°F) WB
     - Interconnecting Piping Length 7.5 m
     - Level Difference of Zero.
2. Capacities are Net Capacities.
3. Due to our policy of innovation some specifications may be changed without notification.
4. L.E.V. : Linear Expansion Valve

Conversion Formula
kcal/h = kW x 860
Btu/h = kW x 3414
cfm = m^3/min x 35.3

Model		Unit	CRNN366BGA0	CRNN426BGA0	CRNN486BEA0
Cooling Capacity		W	10,600	12,300	14,100
		kcal/h	9,116	10,578	12,126
		Btu/h	36,188	41,992	48,137
Heating Capacity		W	11,925	13,837	15,885
		kcal/h	10,255	11,900	13,661
		Btu/h	40,712	47,410	54,231
Casing			Galvanized Steel Plate		
Dimensions (W*H*D)		mm	1,180*298*450	1,230*370*680	1,230*370*680
		inch	46.4*11.7*17.7	48.4*14.6*26.8	48.4*14.6*26.8
Coil	Rows x Columns x FPI		3*12*21	3*14*17	3*14*17
	Face Area	m^2	0.20	0.55	0.25
Moisture removal		*l*/h.	3.5	5.0	6.0
Fan	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output x Number	W	272	391	391
	Air Flow Rate(H/M/L)	cmm	32/29/26.5	38/34/28	40/36/30
		cfm	1,130/1,024/936	1,341/1,200/988	1,413/1,271/1,059
	External Static Pressure	Pa	78.5	78.5	98.1
	Drive		Direct		
	Speed control		Phase control	Steps control	
Temperature Control			Microprocessor, Thermostat for cooling and heating		
Sound Absorbing Thermal Insulation Material			Foamed polystyrene		
Safety Device			Fuse, Thermal Fuse for Fan Motor		
Pipe Connections	Liquid Side	mm(inch)	9.52(3/8)	9.52(3/8)	9.52(3/8)
	Gas Side	mm(inch)	19.05(3/4)	19.05(3/4)	19.05(3/4)
	Drain Pipe(Internal Dia.)	mm	25	25	25
Net Weight		kg(lbs)	38(83.8)	70(154.3)	70(154.3)
Noise Level (Sound Press,1.5m, H/M/L)		dBA±3	44/42/40	46/44/42	48/46/44
Power Supply		Ø,V,Hz	1,220~240,50	1,220~240,50	1,220~240,50
Power Cable		AWG#:P*mm^2	12:3*2.5	12:3*2.5	12:3*2.5
Refrigerant Control			L.E.V	L.E.V	L.E.V
Standard Accessories			Owner Manual, Installation Manual, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws		

Notes:-

1. Capacities are based on the following conditions:
   - Cooling: - Indoor Temperature 27°C(80.6°F) DB /19°C(66.2°F) WB
     - Outdoor Temperature 35°C(95°F) DB /24°C(75.2°F) WB
     - Interconnecting Piping Length 7.5m
     - Level Difference of Zero.
   - Heating: - Indoor Temperature 20°C(68°F) DB / 15°C(59°F) WB
     - Outdoor Temperature 7°C(44.6°F) DB / 6°C(42.8°F) WB
     - Interconnecting Piping Length 7.5 m
     - Level Difference of Zero.
2. Capacities are Net Capacities.
3. Due to our policy of innovation some specifications may be changed without notification.
4. L.E.V. : Linear Expansion Valve

Conversion Formula
kcal/h = kW x 860
Btu/h = kW x 3414
cfm = m^3/min x 35.3

2. Functions

Indoor Unit

- **Operation ON/OFF by Remote controller**
- **Sensing the Room Temperature** • Room temperature sensor. (Thermistor)
- **Room temperature control** • Maintains the room temperature in accordance with the Setting Temperature.
- **Starting Current Control** • Indoor fan is delayed for 5 seconds at the starting.
- **Time Delay Safety Control** • Restarting is inhibited for approx. 3 minutes.
- **Indoor Fan Speed Control** • High, Med, Low
- **Soft Dry Operation Mode** • Intermittent operation of fan at low speed.
- **Auto Restart** • Although the air-conditioner is turned off by a power failure, it is restarted automatically previous operation mode after power supply.
- **Deice (defrost) control (Heating)** • Both the indoor and outdoor fan stops during defrosting. • Hot start after defrost ends.
- **Hot-start Control (Heating)** • The indoor fan does not rotate until the evaporator piping temperature reaches 25°C.
- **High head height Drain pump** • A standard drain-head height of up to 700mm is possible.
- **Central Control(Optional)** • It is operating individually or totally by central control function.
- **Defrost(Deice) control (Heating)** • Both the indoor and outdoor fan stops during defrosting.
- **Hot-start Control (Heating)** • The indoor fan stops until the evaporator pipe temperature will be reached at 28°C.

3. Operation Details

(1) The function of main control

■ Time Delay safety Control

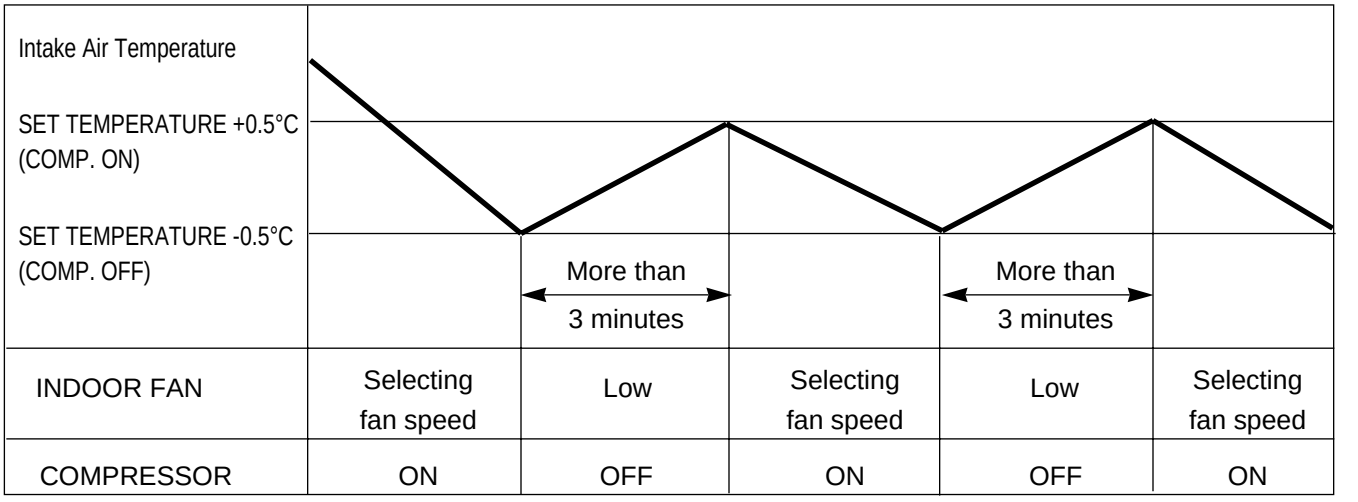
• 30sec··· The 4-way valve is ceased for 30sec. to prevent the refrigerant-gas abnormal noise when the Heating operation is OFF or switched to the other operation mode while compress is off.
While compressor is running, it takes 3~5 seconds to switch to another mode.

■ Soft-Dry Operation

• The indoor fan speed is automatically set to the low, so the shift of the indoor fan speed is impossible because of already being set to the best speed for Dry Operation by microcontroller control.

■ Cooling Mode Operation

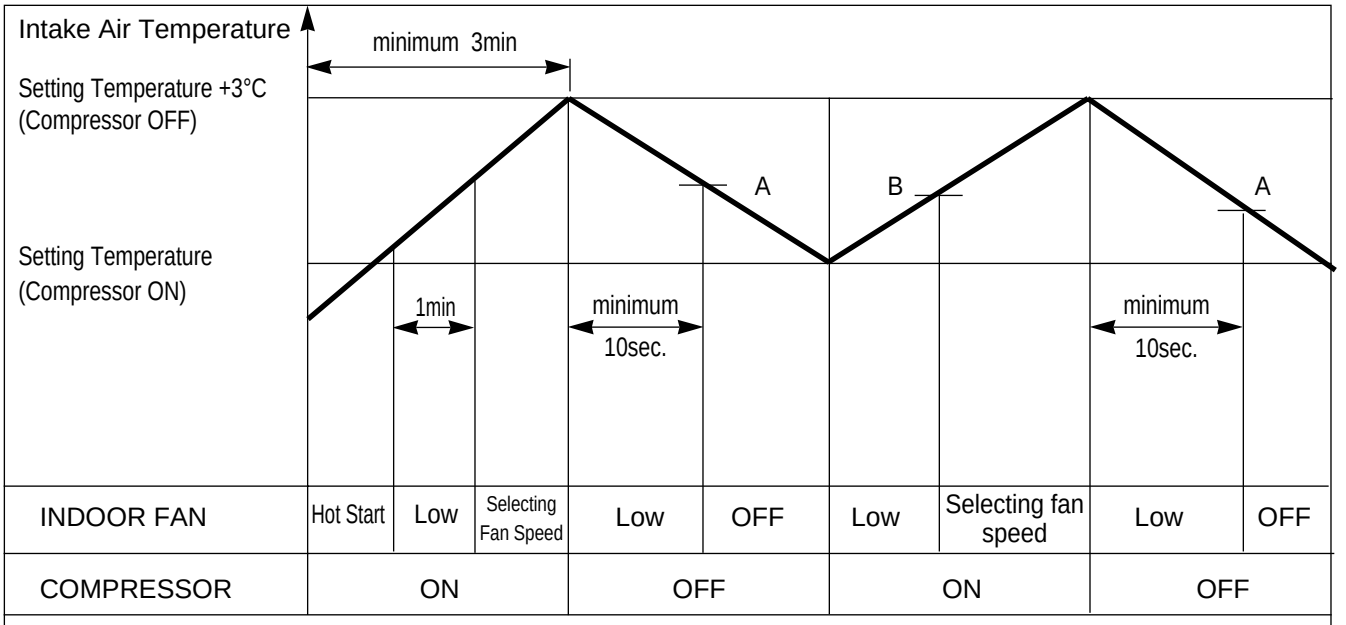
• When selecting the Cooling(❄) Mode Operation, the unit will operate according to the setting by the remote controller and the operation diagram is as following.



INDOOR FAN	Selecting fan speed	Low	Selecting fan speed	Low	Selecting fan speed
COMPRESSOR	ON	OFF	ON	OFF	ON

■ Heating Mode Operation

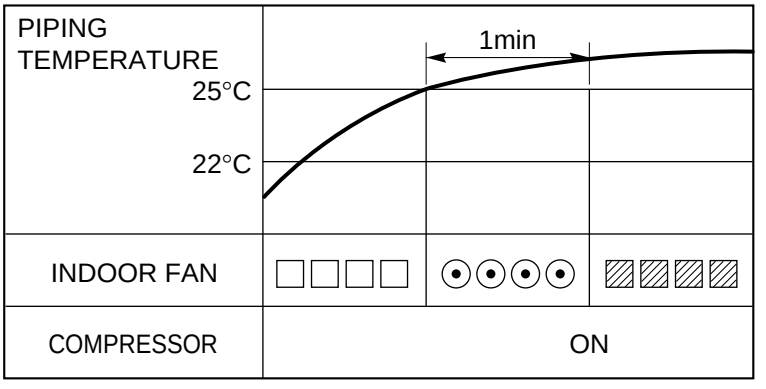
The unit will operate according to the setting by the remote controller and the operation diagram is shown as following.



- A point; While the indoor Heat-Exchanger temperature is higher than 40°C fan operates at low speed, when it becomes lower than 40˚C fan stops.
- B point; When the indoor Heat-Exchanger temperature is higher than 42°C, fan operates at seleted fan speed, when it becomes lower than 39°C, the fan operates at low speed.

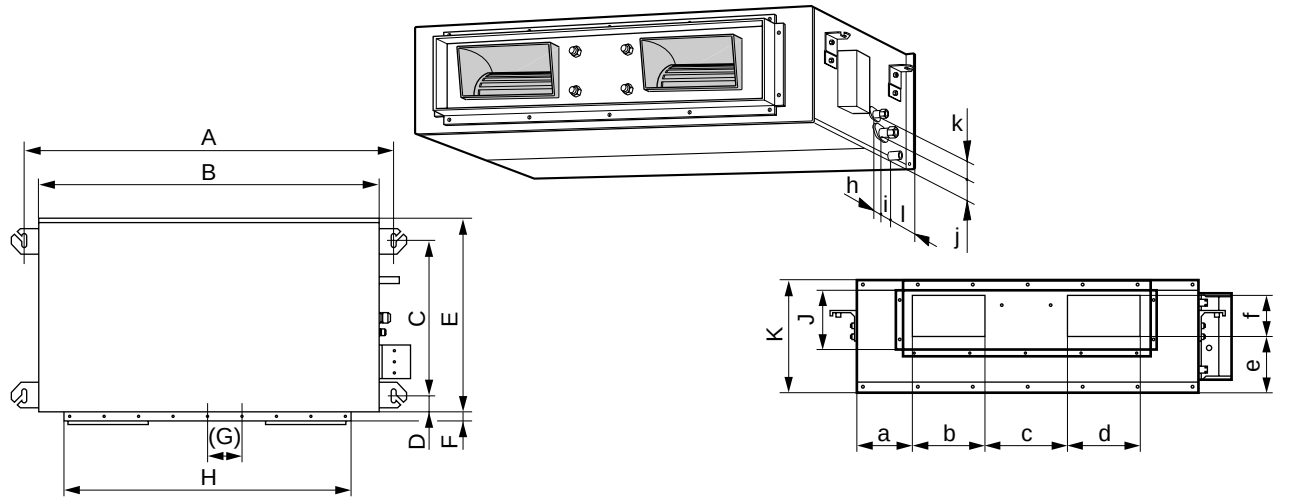
■ Hot-Start Control

- The indoor fan does not rotate until the evaporator piping temperature reaches 25°C.
- The operation diagram is as following.



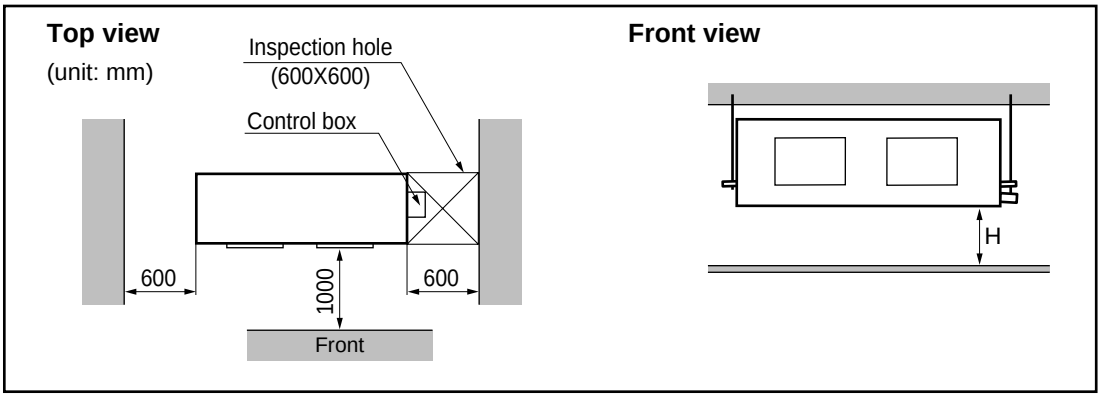
▨ : Selected Fan ⊙ : Low Fan □ : Fan Stop

4. Dimensional Drawings

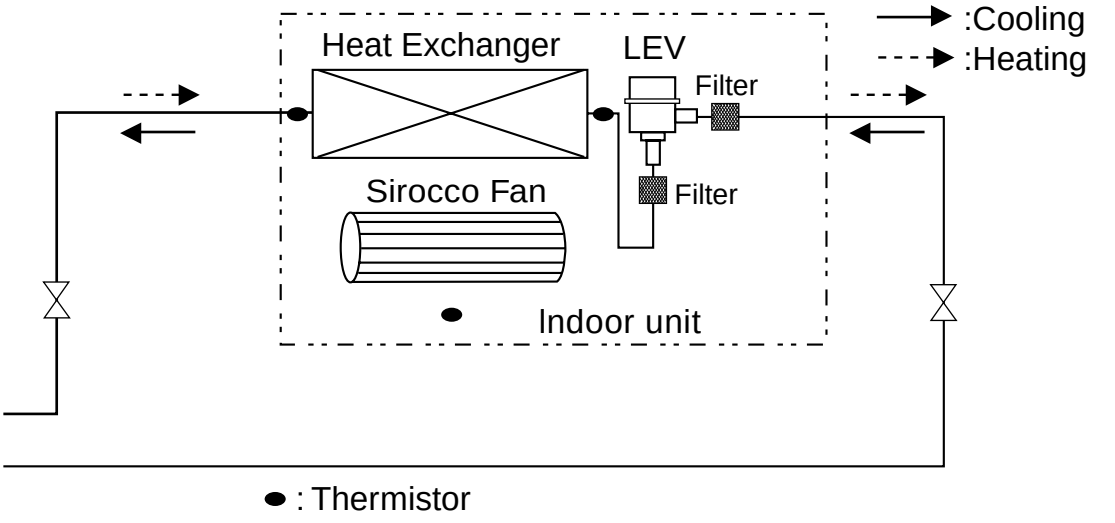


(Unit: mm)

Model	A	B	C	D	E	F	(G)	H	J	K	a	b	c	d	e	f	h	i	j	k	l
186/246BH	932	882	355	45.5	450	30	87	750	163	260	61.5	243	212.3	243	110	130	52	66	81	30	158.5
286/366/426BG	1232	1182	355	45.5	450	30	87	830	186	298	229.5	243	232	243	116	160	53	59	81	19	158.5
486BE	1292	1230	570.5	54	680	30	120	1006	294	370	253.5	253	217	253	152	186	42	143	82	50	172



5. Piping Diagrams

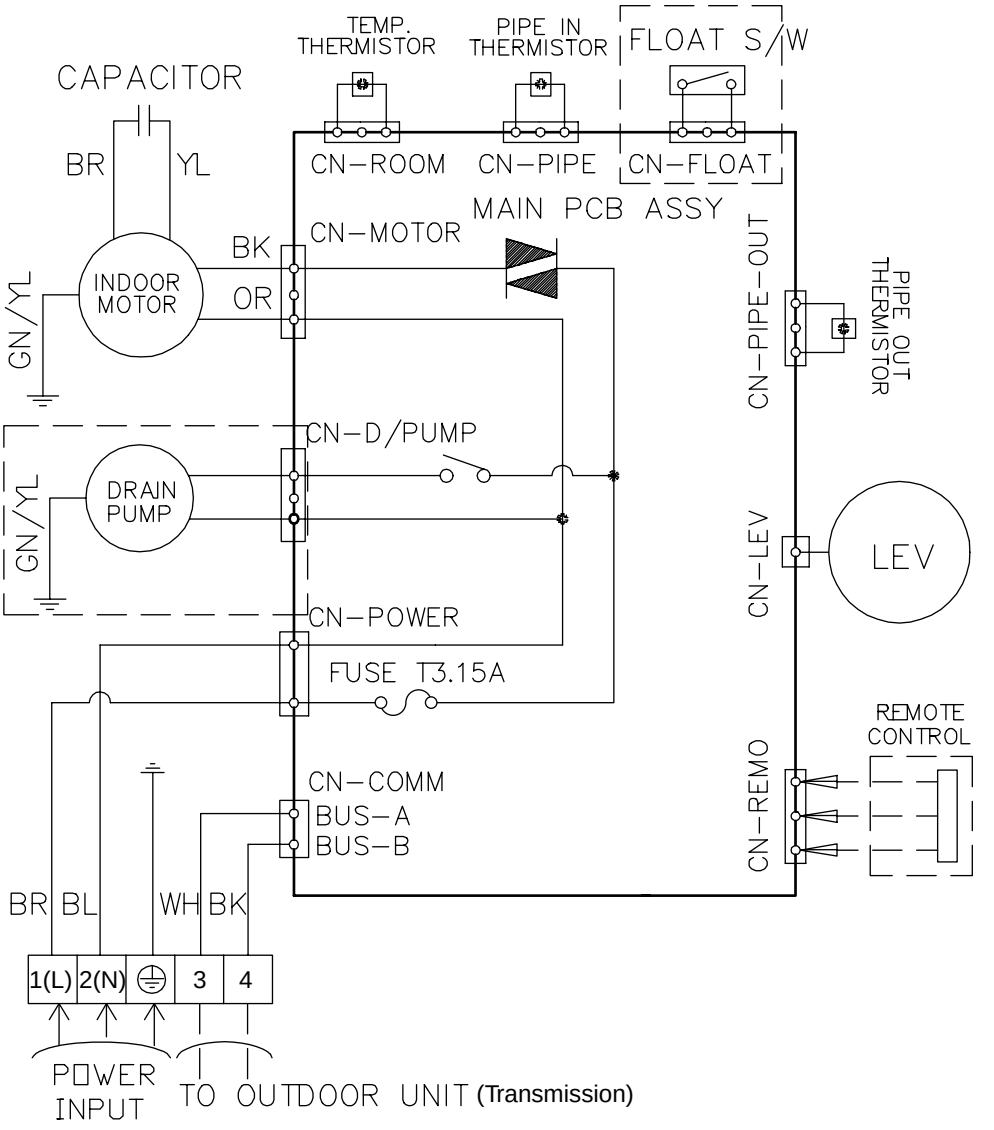


Refrigerant pipe connection port diameter

[unit: mm(inch)]

Model	Gas	Liquid
CRNN186BHA0	15.88(5/8)	9.52(3/8)
CRNN246BHA0		
CRNN286BGA0		
CRNN366BGA0	19.05(3/4)	9.52(3/8)
CRNN426BGA0	19.05(3/4)	9.52(3/8)
CRNN486BEA0		

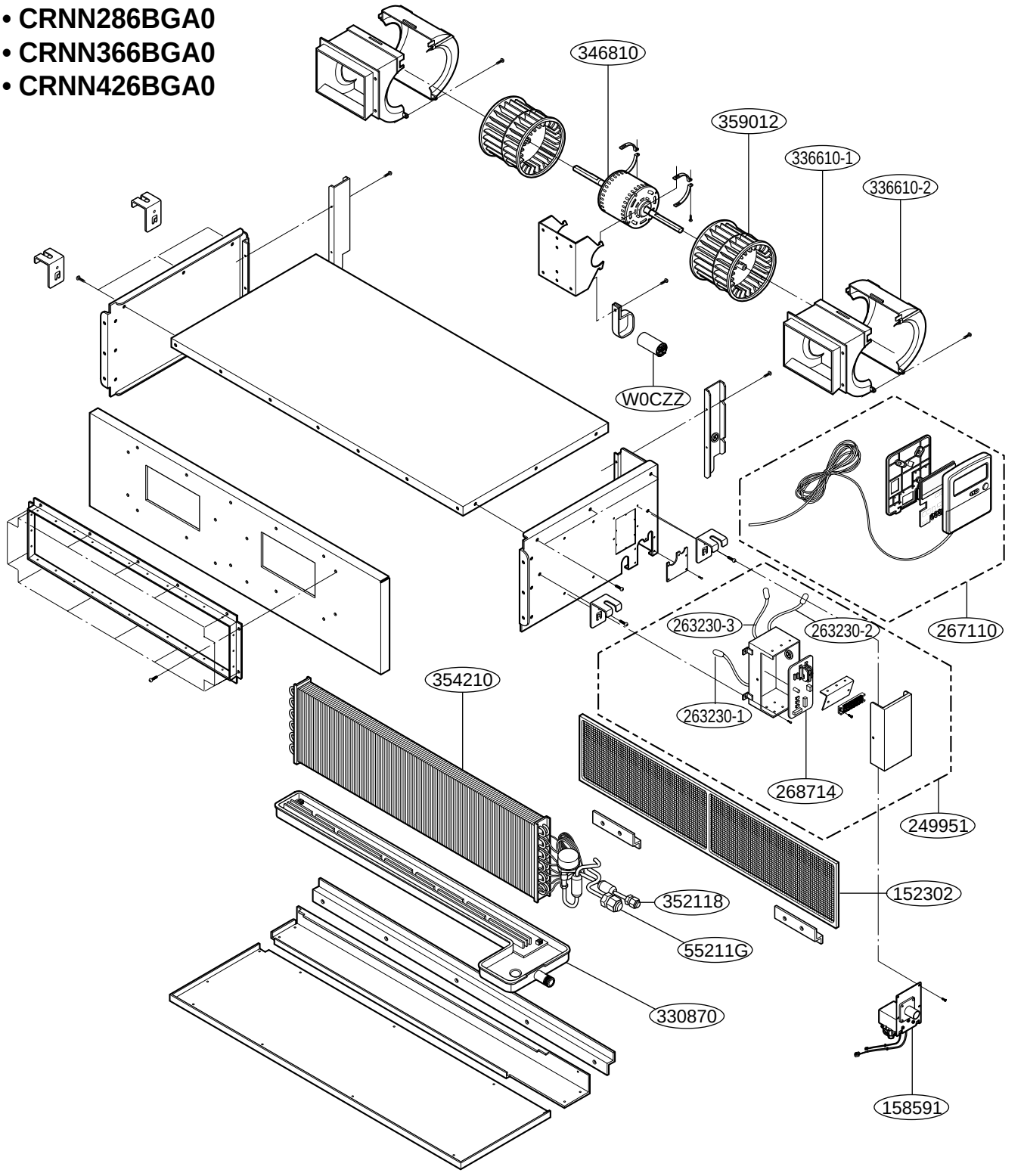
6. Wiring Diagrams



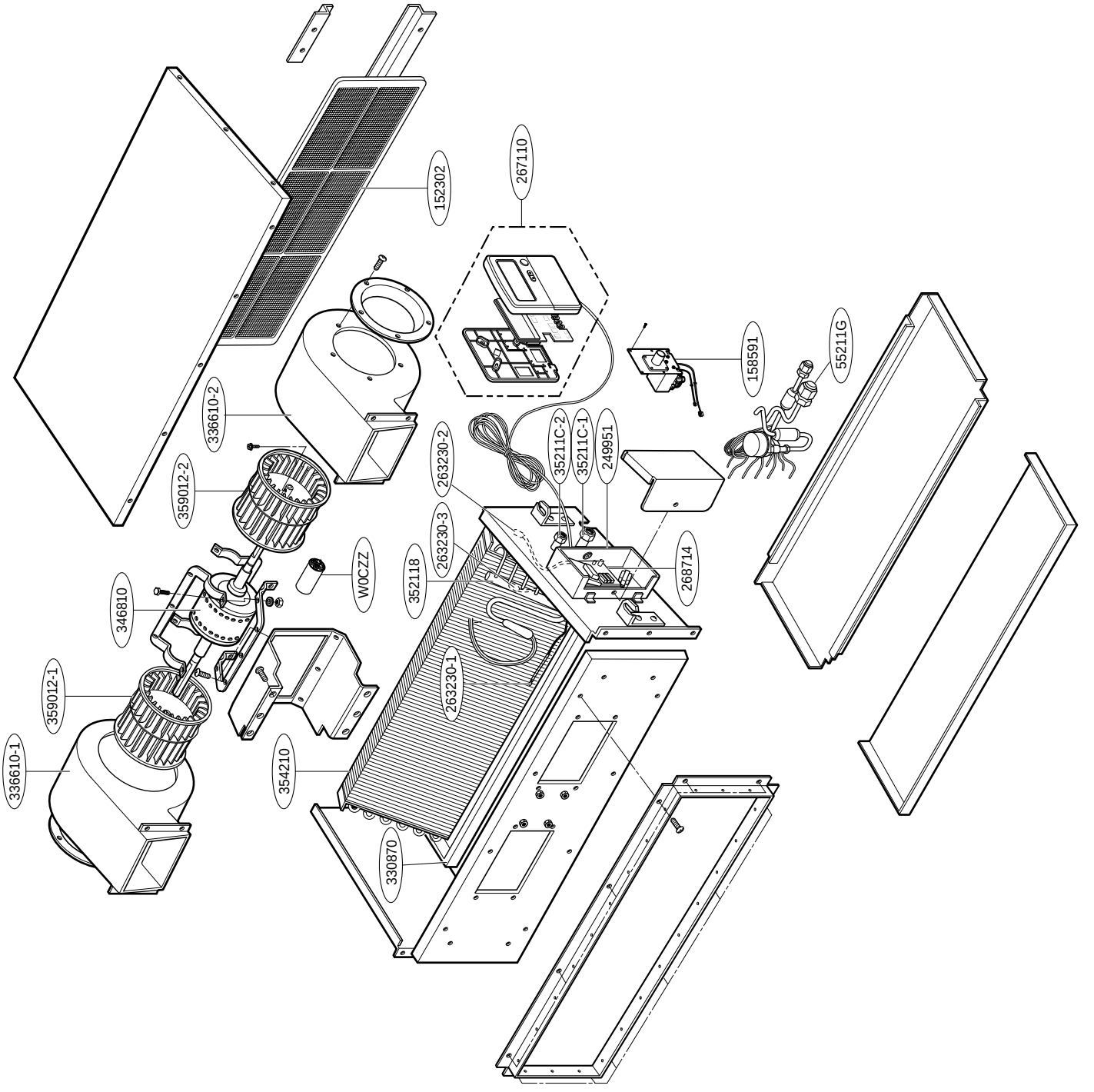
CONNECTOR NUMBER	SPEC	COLOR	DESCRIPTION
CN-POWER	AC POWER SUPPLY	WHITE	AC POWER LINE INPUT FOR INDOOR CONTROLLER
CN-MOTOR2	AC FAN MOTOR OUTPUT	YELLOW	MOTOR OUTPUT OF PHASE CONTROL
CN-D/PUMP	DRAIN PUMP OUTPUT	WHITE	AC OUTPUT FOR DRAIN PUMP
CN-COMM	COMMUNICATION	WHITE	COMMUNICATION BETWEEN INDOOR AND OUTDOOR
CN-LEV	LEV OUTPUT	WHITE	LEV CONTROL OUTPUT
CN-FLOAT	FLOAT SWITCH INPUT	BLUE	FLOAT SWITCH SENSING
CN-PIPE	PIPE SENSOR	WHITE	PIPE THERMISTOR
CN-PIPE/O	DISCHARGE PIPE SENSOR	RED	DISCHARGE PIPE THERMISTOR
CN-ROOM	ROOM SENSOR	BLUE	ROOM THERMISTOR
CN-REMO	REMOTE CONTROLLER	WHITE	REMOTE CONTROL LINE
CN-AIRC	AIR CLEAN	WHITE	AIR CLEAN SIGNAL

7. Exploded View

- **CRNN186BHA0**
- **CRNN246BHA0**
- **CRNN286BGA0**
- **CRNN366BGA0**
- **CRNN426BGA0**



• CRNN486BEA0



8. Replacement Parts List

LOCATION No.	DESCRIPTION	Part No.		REMARKS
		CRNN186BHA0	CRNN246BHA0	
152302	FILTER(MECH),A/C	5230A30001M	5230A30001M	R
152302	FILTER(MECH), A/C	5230A30001M		R
158591	PUMP ASSEMBLY, WATER	5859A20002A		R
249951	CONTROL BOX ASSEMBLY, INDOOR	4995A20164M	4995A20164L	R
263230-1	THERMISTOR ASSEMBLY(ROOM)	6323AQ3214E		R
263230-2	THERMISTOR ASSEMBLY(PIPE-IN)	6323AQ3226G		R
263230-3	THERMISTOR ASSEMBLY(PIPE-OUT)	6323AQ3226W		R
266012	SWITCH ASSEMBLY, FLOAT	6601A20001E		R
267110	REMOTE CONTROLLER ASSEMBLY	6711A20043D		R
268714	PWB(PCB) ASSEMBLY, MAIN	6871A10089J	6871A10089K	R
330870	DRAIN PAN ASSEMBLY	3087A10008D		R
336610-1	HOUSING(MECH), WRAPPER	3660A20017A		R
336610-2	HOUSING(MECH), WRAPPER	3660A20018A		R
346810	MOTOR ASEMBLY, INDOOR	4681A10013C		R
352118	TUBE ASSEMBLY, MENIFOLD(INDOOR)	5211A20465D		R
354210	EVAPORATOR ASSEMBLY, FIRST	5421A20100A	5421A20100B	R
359012	FAN ASSEMBLY, BLOWER	5901A10026A		R
352115	TUBE ASSEMBLY, EVAPORATOR IN	5211A10305B	5211A10305A	R
W0CZZ	CAPACITOR, DRAWING	2A00986D		R

LOCATION No.	DESCRIPTION	Part No.			REMARKS
		CRNN286BGA0	CRNN366BGA0	CRNN426BGA0	
152302	FILTER(MECH), A/C	5230A30001L			R
158591	PUMP ASSEMBLY, WATER	5859A20002A			R
249951	CONTROL BOX ASSEMBLY, INDOOR	4995A10127F	4995A10127G	4995A10127H	R
263230-1	THERMISTOR ASSEMBLY(ROOM)	6323A30004D			R
263230-2	THERMISTOR ASSEMBLY(PIPE-IN)	6323AQ3226G			R
263230-3	THERMISTOR ASSEMBLY(PIPE-OUT)	6323AQ3226W			R
266012	SWITCH ASSEMBLY, FLOAT	6601A20001E			R
267110	REMOTE CONTROLLER ASSEMBLY	6711A20043D			R
268714	PWB(PCB) ASSEMBLY, MAIN	6871A10089U	6871A10089L	6871A10089V	R
330870	DRAIN PAN ASSEMBLY	3087A10008C			R
336610-1	HOUSING(MECH), WRAPPER	3660A20019A			R
336610-2	HOUSING(MECH), WRAPPER	3660A20020A			R
346810	MOTOR ASEMBLY, INDOOR	4681A10013A			R
352118	TUBE ASSEMBLY, MENIFOLD(INDOOR)	5211A20416G		5211A20416H	R
354210	EVAPORATOR ASSEMBLY, FIRST	5421A10027C			R
359012	FAN ASSEMBLY, BLOWER	5901A10026A			R
55211G	TUBE ASSEMBLY, EXPANSION	5211A10426A			R
W0CZZ	CAPACITOR, DRAWING	2A00986D			R

LOCATION No.	DESCRIPTION	Part No.	REMARKS
		CRNN486BEA0	
152302	FILTER(MECH), A/C	5230A30001A	R
158591	PUMP ASSEMBLY, WATER	5859A10002A	R
249951	CONTROL BOX ASSEMBLY, INDOOR	4995A10127J	R
263230-1	THERMISTOR ASSEMBLY(ROOM)	6323A30004D	R
263230-2	THERMISTOR ASSEMBLY(PIPE-IN)	6323AQ3226G	R
263230-3	THERMISTOR ASSEMBLY(PIPE-OUT)	6323AQ3226W	R
266012	SWITCH ASSEMBLY, FLOAT	6601A20001E	R
267110	REMOTE CONTROLLER ASSEMBLY	6711A10002D	R
268714	PWB(PCB) ASSEMBLY, MAIN	6871A10089W	R
330870	DRAIN PAN ASSEMBLY	3087A20023A	R
336610-1	HOUSING(MECH), WRAPPER	3661A20009E	R
336610-2	HOUSING(MECH), WRAPPER	3661A20009F	R
346810	MOTOR ASEMBLY, INDOOR	4681A20005K	R
352118	TUBE ASSEMBLY, MENIFOLD(INDOOR)	5211A30076B	R
354210	EVAPORATOR ASSEMBLY, FIRST	5421A20008A	R
359012-1	FAN ASSEMBLY, BLOWER	5901A10015E	R
359012-2	FAN ASSEMBLY, BLOWER	5901A10015F	R
55211G	TUBE ASSEMBLY, EXPANSION	5211A10416A	R
W0CZZ	CAPACITOR, DRAWING	0CZZA20001C	R
35211C-1	TUBE ASSEMBLY,DISCHARGE(IN)	5211A30077A	R
35211C-2	TUBE ASSEMBLY,DISCHARGE(OUT)	5211A30094B	R

CRNN-BN / CRNN-BJ
Ceiling Concealed Duct Type (Low static)

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1. Specifications

Model		Unit	CRNN076BNG0	CRNN096BJG0	CRNN126BJG0
Cooling Capacity		W	2,100	2,600	3,500
		kcal/h	1,806	2,235	3,009
		Btu/h	7,165	8,871	11,942
Heating Capacity		W	2,363	2,925	3,923
		kcal/h	2,031	2,515	3,385
		Btu/h	8,061	9,980	13,435
Casing			Galvanized Steel Plate		
Dimensions (W*H*D)		mm	783*220*520	873*220*520	873*220*520
		inch	30.8*8.7*20.5	34.3*8.7*20.5	34.3*8.7*20.5
Coil	Rows*Steps*Fin Pitch	inch	2*9*14	2*9*14	2*9*14
Moisture removal		l/h	1.0	1.0	1.5
Fan	Model		D-7K	D-9K	D-12K
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output	W	13	17	20
	Air Flow Rate(H/M/L)	CMM	6.4/5.9/5.4	7.0/6.5/6.0	10.2/9.2/8.2
		CFM	226/208/191	247/230/212	360/325/290
	External Static Pressure	Pa	0	0	0
	Drive		Direct		
	Speed control		Steps Control		
Temperature Control			Microprocessor,Thermistat for cooling and heating		
Sound Absorbing Thermal Insulation Material			Foamed polystyrene		
Safety Device			Fuse,Thermal Fuse for Fan Motor		
Pipe Connections	Liquid Side	mm(inch)	6.35(1/4)	6.35(1/4)	6.35(1/4)
	Gas Side	mm(inch)	12.7(1/2)	12.7(1/2)	12.7(1/2)
	Drain Pipe(Internal Dia.)	mm	25	25	25
Net Weight		kg(lbs)	23(50.7)	24(52.9)	24(52.9)
Noise Level(SoundPress,1.5m,H/M/L)		dBA±3	36/34/32	37/35/33	38/36/34
Power Supply		Ø,V,Hz	1,220~240,50	1,220~240,50	1,220~240,50
Power Cable		AWG#:P*mm^2	12:3 * 2.5	12:3 * 2.5	12:3 * 2.5
Refrigerant Control			LEV	LEV	LEV
Standard Accessories			Owner's Manual, Installation Manual, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws		

Notes:-

1. Capacities are based on the following conditions:
   - Cooling: - Indoor Temperature 27°C(80.6°F) DB /19°C(66.2°F) WB
     - Outdoor Temperature 35°C(95°F) DB /24°C(75.2°F) WB
     - Interconnecting Piping Length 7.5m
     - Level Difference of Zero.
   - Heating: - Indoor Temperature 20°C(68°F) DB / 15°C(59°F) WB
     - Outdoor Temperature 7°C(44.6°F) DB / 6°C(42.8°F) WB
     - Interconnecting Piping Length 7.5 m
     - Level Difference of Zero.
2. Capacities are Net Capacities.
3. Due to our policy of innovation some specifications may be changed without notification.
4. L.E.V. : Linear Expansion Valve

Conversion Formula
kcal/h = kW x 860
Btu/h = kW x 3414
cfm = m^3/min x 35.3

2. Functions

Indoor Unit

- **Operation ON/OFF by Remote controller**
- **Sensing the Room Temperature** • Room temperature sensor. (Thermistor)
- **Room temperature control** • Maintains the room temperature in accordance with the Setting Temperature.
- **Starting Current Control** • Indoor fan is delayed for 5 seconds at the starting.
- **Time Delay Safety Control** • Restarting is inhibited for approx. 3 minutes.
- **Indoor Fan Speed Control** • High, Med, Low
- **Soft Dry Operation Mode** • Intermittent operation of fan at low speed.
- **Auto Restart** • Although the air-conditioner is turned off by a power failure, it is restarted automatically previous operation mode after power supply.
- **Deice (defrost) control (Heating)** • Both the indoor and outdoor fan stops during defrosting. • Hot start after defrost ends.
- **Hot-start Control (Heating)** • The indoor fan does not rotate until the evaporator piping temperature reaches 25°C.
- **High head height Drain pump** • A standard drain-head height of up to 700mm is possible.
- **Central Control(Optional)** • It is operating individually or totally by central control function.

3. Operation Details

(1) The function of main control

■ Time Delay safety Control

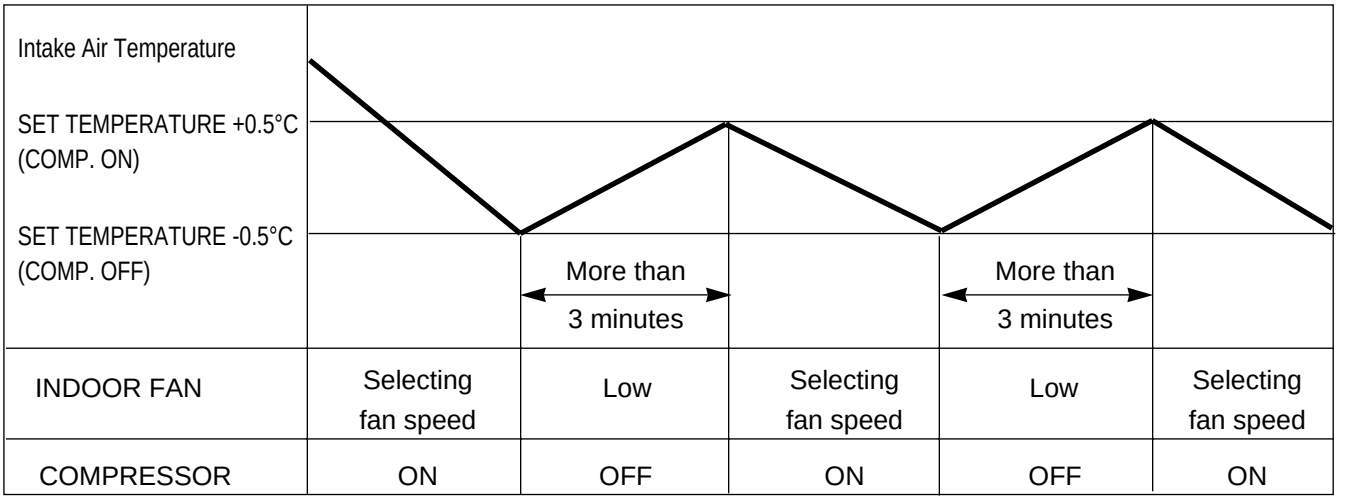
• 30sec··· The 4-way valve is ceased for 30sec. to prevent the refrigerant-gas abnormal noise when the Heating operation is OFF or switched to the other operation mode while compress is off.
While compressor is running, it takes 3~5 seconds to switch to another mode.

■ Soft-Dry Operation

• The indoor fan speed is automatically set to the low, so the shift of the indoor fan speed is impossible because of already being set to the best speed for Dry Operation by microcontroller control.

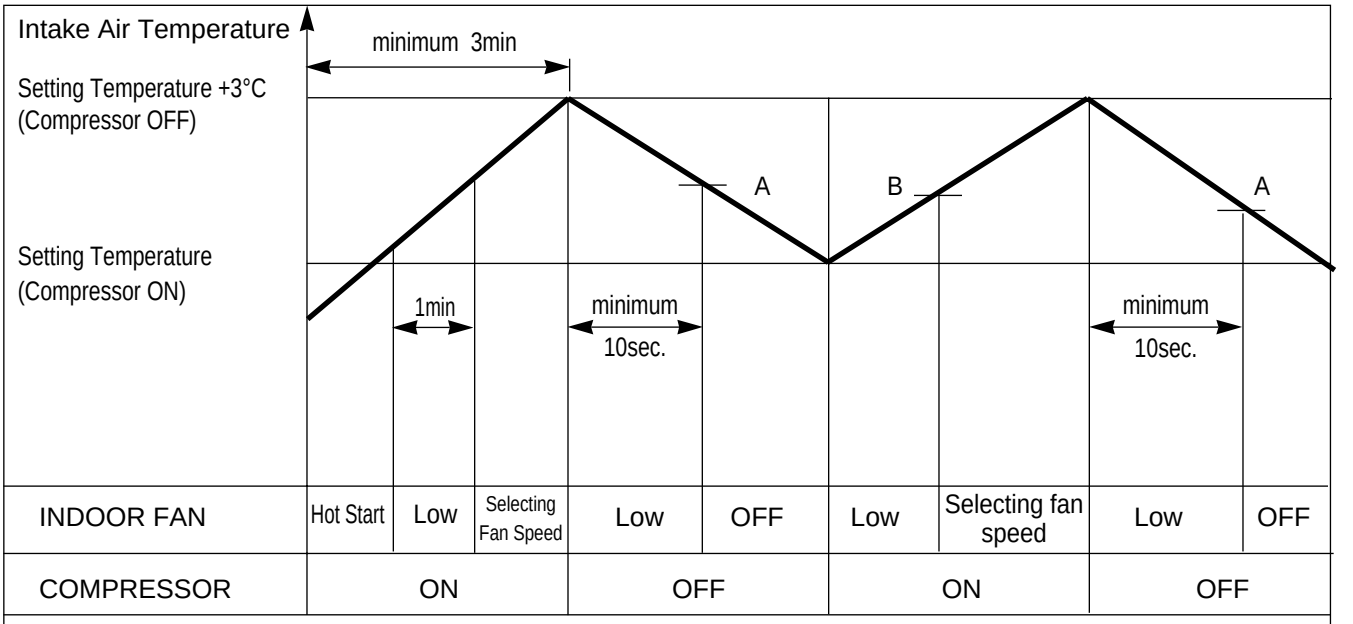
■ Cooling Mode Operation

• When selecting the Cooling(❋) Mode Operation, the unit will operate according to the setting by the remote controller and the operation diagram is as following.



■ Heating Mode Operation

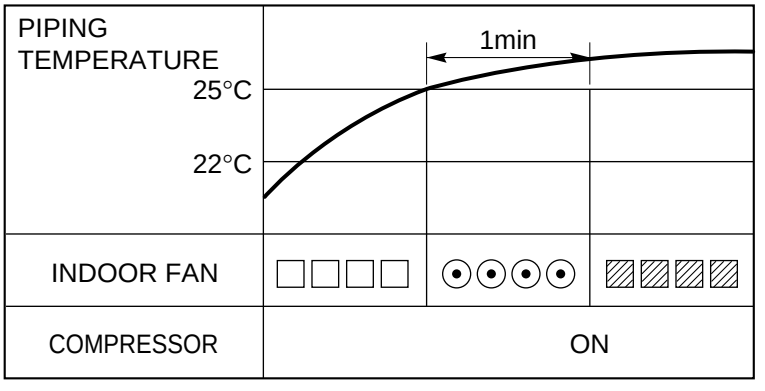
The unit will operate according to the setting by the remote controller and the operation diagram is shown as following.



- A point; While the indoor Heat-Exchanger temperature is higher than 40°C fan operates at low speed, when it becomes lower than 40˚C fan stops.
- B point; When the indoor Heat-Exchanger temperature is higher than 42°C, fan operates at seleted fan speed, when it becomes lower than 39°C, the fan operates at low speed.

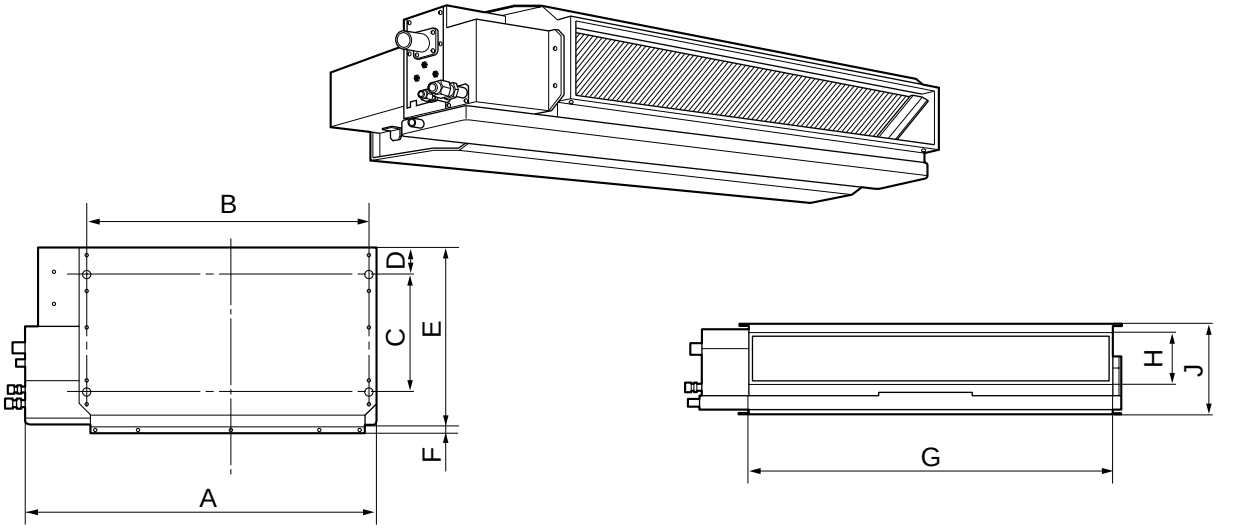
■ Hot-Start Control

- The indoor fan does not rotate until the evaporator piping temperature reaches 25°C.
- The operation diagram is as following.

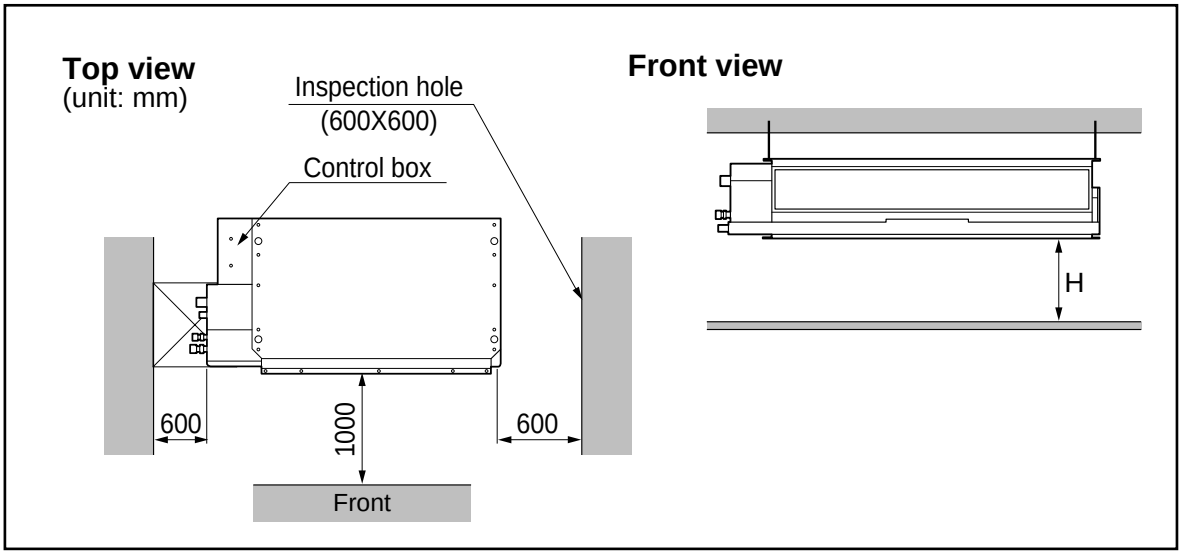


▨ : Selected Fan ⊙ : Low Fan □ : Fan Stop

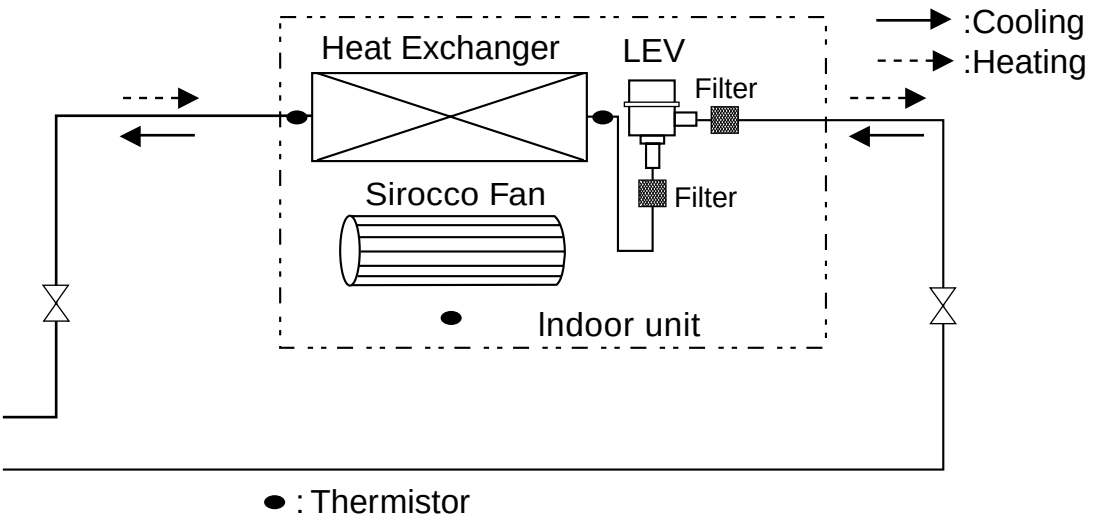
4. Dimensional Drawings



Model	A	B	C	D	E	F	G	H	J
CRNN076BNG0	783	667	300	100	500	20	639	120	220
CRNN096BJG0	873	767	300	100	500	20	729	120	220
CRNN126BJG0	873	767	300	100	500	20	729	120	220



5. Piping Diagrams

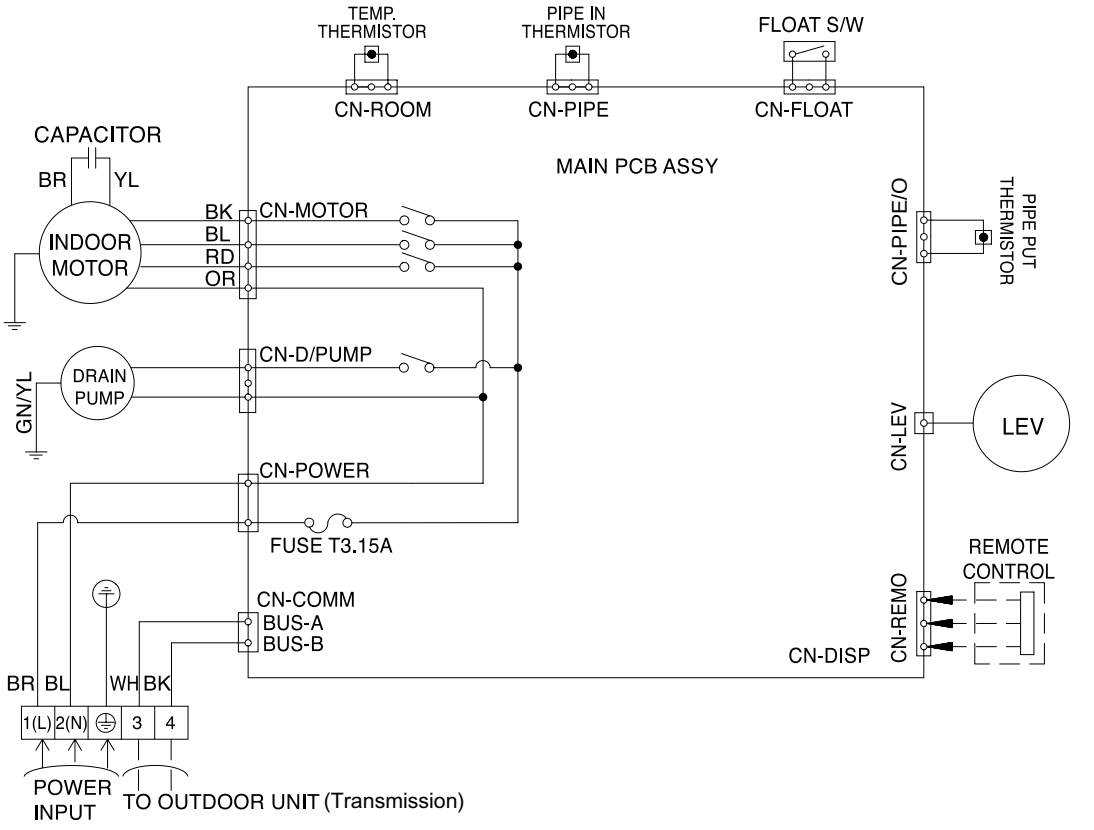


Refrigerant pipe connection port diameter

[unit: mm(inch)]

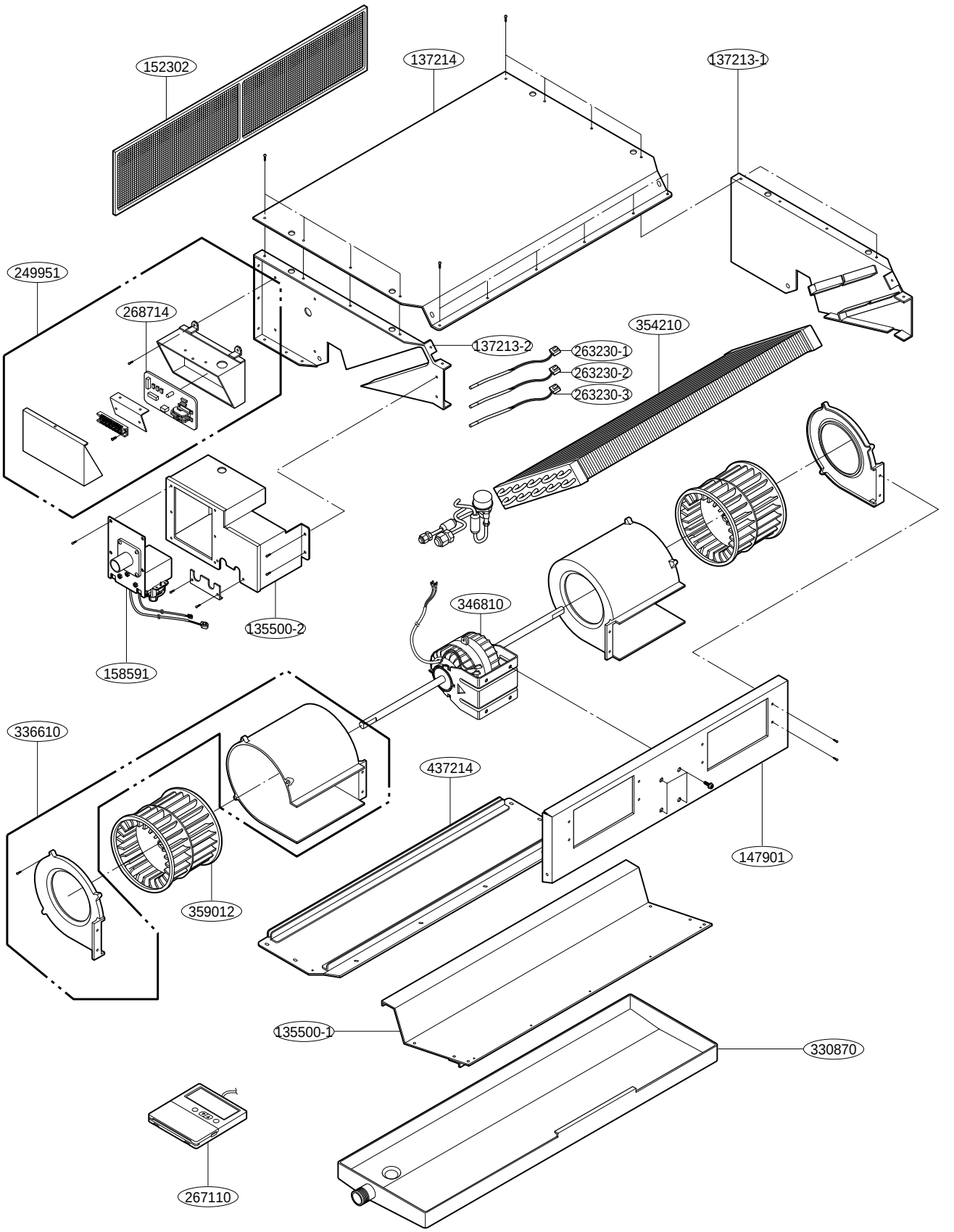
Model	Gas	Liquid
CRNN076BNG0	Ø12.7(1/2)	Ø6.35(1/4)
CRNN096BJG0		
CRNN126BJG0		

6. Wiring Diagrams



CONNECTOR NUMBER	SPEC	COLOR	DESCRIPTION
CN-POWER	AC POWER SUPPLY	WHITE	AC POWER LINE INPUT FOR INDOOR CONTROLLER
CN-MOTOR2	AC FAN MOTOR OUTPUT	YELLOW	MOTOR OUTPUT OF PHASE CONTROL
CN-D/PUMP	DRAIN PUMP OUTPUT	WHITE	AC OUTPUT FOR DRAIN PUMP
CN-COMM	COMMUNICATION	WHITE	COMMUNICATION BETWEEN INDOOR AND OUTDOOR
CN-LEV	LEV OUTPUT	WHITE	LEV CONTROL OUTPUT
CN-FLOAT	FLOAT SWITCH INPUT	BLUE	FLOAT SWITCH SENSING
CN-PIPE	PIPE SENSOR	WHITE	PIPE THERMISTOR
CN-PIPE/O	DISCHARGE PIPE SENSOR	RED	DISCHARGE PIPE THERMISTOR
CN-ROOM	ROOM SENSOR	BLUE	ROOM THERMISTOR
CN-REMO	REMOTE CONTROLLER	WHITE	REMOTE CONTROL LINE
CN-AIRC	AIR CLEAN	WHITE	AIR CLEAN SIGNAL

7. Exploded View



8. Replacement Parts List

LOCATION No.	DESCRIPTION	PART NO.			REMARKS
		CRNN076BNG0	CRNN096BJG0	CRNN126BJG0	
135500-1	COVER	3550A20214A	3550A20214B	3550A20214B	R
135500-2	COVER	3550A20215A	3550A20215A	3550A20215A	R
137213-1	PANEL ASSEMBLY,SIDE	3721A20136A	3721A20136A	3721A20136A	R
137213-2	PANEL ASSEMBLY,SIDE	3721A20136B	3721A20136B	3721A20136B	R
137214	PANEL ASSEMBLY,UPPER	3721A20135A	3721A20135B	3721A20135B	R
147901	BARRIER,INDOOR	4790A20043A	4790A20043B	4790A20043B	R
152302	FILTER(MECH),A/C	5230A30009A	5230A30009B	5230A30009B	R
158591	PUMP ASSEMBLY,WATER	5859A20002B	5859A20002B	5859A20002B	R
249951	CONTROL BOX ASSEMBLY,INDOOR	4995A20297A	4995A20297B	4995A20297C	R
263230-1	THERMISTOR ASSEMBLY(ROOM)	6323A30004E	6323A30004E	6323A30004E	R
263230-2	THERMISTOR ASSEMBLY(PIPE-IN)	6323A30002A	6323A30002A	6323A30002A	R
263230-3	THERMISTOR ASSEMBLY(PIPE-OUT)	6323AQ3226T	6323AQ3226T	6323AQ3226T	R
267110	REMOTE CONTROLLER ASSEMBLY	6711A10002D	6711A10002D	6711A10002D	R
268714	PWB(PCB) ASSEMBLY,MAIN	6871A10108A	6871A10108B	6871A10108C	R
330870	DRAIN PAN ASSEMBLY	3087A20019A	3087A20019B	3087A20019B	R
336610	HOUSING ASSEMBLY (MECH)	3661A20022A	3661A20023A	3661A20023A	R
346810	MOTOR ASSEMBLY,INDOOR	4681A20100A	4681A20100B	4681A20100C	R
354210	EVAPORATOR ASSEMBLY,FIRST	5421A20147A	5421A20147B	5421A20147B	R
359012	FAN ASSEMBLY,BLOWER	5901A20027A	5901A20027B	5901A20027B	R
437214	PANEL ASSEMBLY,BASE	3721A20137A	3721A20137B	3721A20137B	R

CRNN-VB
Convertible Type

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1. Specifications

Model		Unit	CRNN186VBA0	CRNN246VBA0
Cooling Capacity		W	5,300	7,032
		kcal/h	4,557	6,048
		Btu/h	18,084	24,600
Heating Capacity		W	5,963	7,735
		kcal/h	5,127	6,653
		Btu/h	20,345	26,400
Color			White	
Dimensions (W*H*D)		mm	1200*615*205	
		inch	47.24*24.21*8.07	
Casing			Galvanized Steel plate + Painting	
Coil	Rows x Columns x FPI		2*12*18	2*12*18
	Face Area	m^2	0.26	0.26
Moisture removal		*l*/h.	2.5	3.0
Fan	Type		Cross Flow Fan	
	Motor Output x Number	W	30	30
	Air Flow Rate(High)	cmm	13.5	16
		cfm	477	565
	Drive		Direct	
	Speed control		Phase control	
Temperature Control			Microprocessor, Thermostat for cooling and heating	
Sound Absorbing Thermal Insulation Material			Foamed polystyrene	
Safety Device			Fuse, Thermal Fuse for Fan Motor	
Pipe Connections	Liquid Side	mm(inch)	9.52 (3/8)	
	Gas Side	mm(inch)	15.88 (5/8)	
	Drain Pipe(Internal Dia.)	mm	17	
Net Weight		kg(lbs)	30(66.1)	
Noise Level (Sound Press,1.5m, H/M/L)		dBA±3	43 / 40 / 37	45/42/39
Power Supply		Ø,V,Hz	1,220~240,50	
Power Cable		AWG#:P*mm^2	12:3*2.5	
Refrigerant Control			L.E.V	
Standard Accessories			Owner Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Clamps, Washers, Flare Nut.	

Notes:-

1. Capacities are based on the following conditions:
   - Cooling: - Indoor Temperature 27°C(80.6°F) DB /19°C(66.2°F) WB
     - Outdoor Temperature 35°C(95°F) DB /24°C(75.2°F) WB
     - Interconnecting Piping Length 7.5m
     - Level Difference of Zero.
   - Heating: - Indoor Temperature 20°C(68°F) DB / 15°C(59°F) WB
     - Outdoor Temperature 7°C(44.6°F) DB / 6°C(42.8°F) WB
     - Interconnecting Piping Length 7.5 m
     - Level Difference of Zero.
2. Capacities are Net Capacities.
3. Due to our policy of innovation some specifications may be changed without notification.
4. L.E.V. : Linear Expansion Valve

Conversion Formula
kcal/h = kW x 860
Btu/h = kW x 3414
cfm = m^3/min x 35.3

2. Installstion

Indoor Unit

Operation ON/OFF by Remote controller

Sensing the Room Temperature

- Room temperature sensor. (Thermistor)

Room temperature control

- Maintains the room temperature in accordance with the Setting Temperature.

Starting Current Control

- Indoor fan is delayed for 5 seconds at the starting.

Time Delay Safety Control

- Restarting is inhibited for approx. 3 minutes.

Indoor Fan Speed Control

- High, Med, Low, Chaos

Operation indication Lamps (LED)

- --- Lights up in operation
- --- Lights up in Sleep Mode
- --- Lights up in Timer Mode
- --- Lights up in Deice Mode or Hot Start Mode

Soft Dry Operation Mode

- Intermittent operation of fan at low speed.

Sleep Mode Auto Control

- The fan is switched to low(Cooling), med(Heating) speed.
- The unit will be stopped after 1, 2, 3, 4, 5, 6, 7 hours.

Natural Air Control by CHAOS Logic

- The fan is switched to intermittent or irregular operation
- The fan speed is automatically switched from high to low speed.

Airflow Direction Control

- The louver can be set at the desired position or swing up and down, right and left automatically.

Auto Operation

- The setting temperature, indoor fan speed and desired operation made are automatically set by fuzzy rule.

Deice (defrost) control (Heating)

- Both the indoor and outdoor fan stops during deicing.
- Hot start after deice ends.

Hot-start Control (Heating)

- The indoor fan does not rotate until the evaporator piping temperature will be reached at 22°C.

3. Operation Details

(1) The function of main control

■ Time Delay Safety Control

• 3min… The compressor is ceased for 3minutes to balance the pressure in the refrigeration cycle. (Protection of compressor)

• 5sec… Vertical air flow direction control louvers open in 5 seconds to prevent noise between louvers and wind.

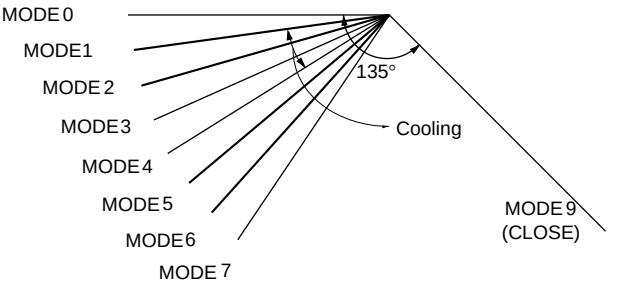
• 30sec… The 4-way valve is ceased for 30sec. to prevent the refrigerant-gas abnormal noise when the Heating operation is OFF or switched to the other operation mode while compress is off.
While compressor is running, it takes 3~5 seconds to switch.

■ Airflow Direction Control

• This function is to swing the louver up and down automatically and to set it at the desired position.

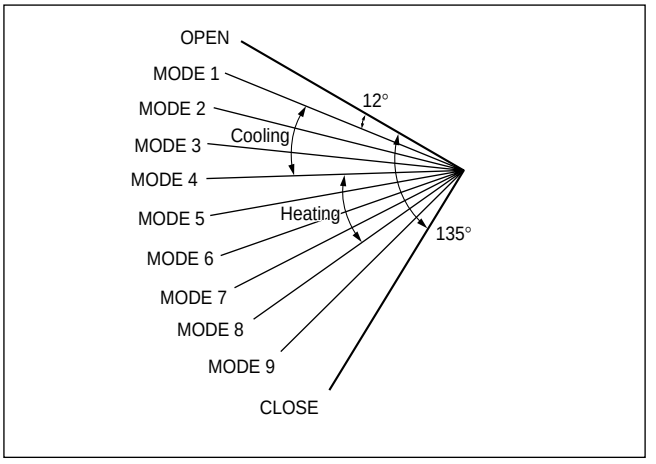
• The procedure is as the following.

1st ; Press the ON/OFF Button to operate the product.
2nd ; Press the Airflow Direction Control Button to swing the louver up and down automatically.
3nd ; Repress the Airflow Direction Control Button to set the louver as the desired position.

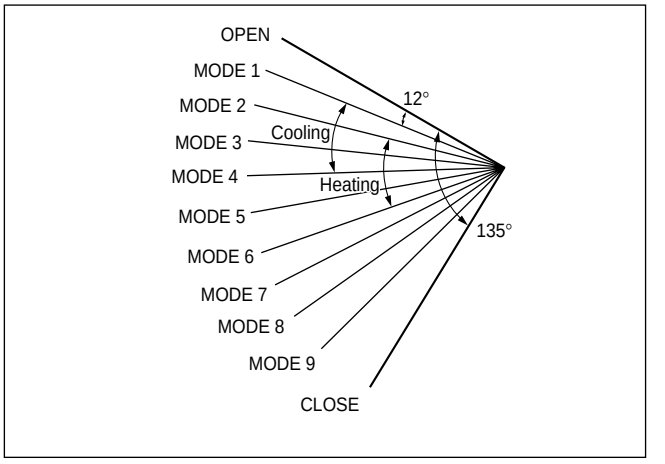


※ For Heating Model

• Airflow direction control figure when installed on the floor.

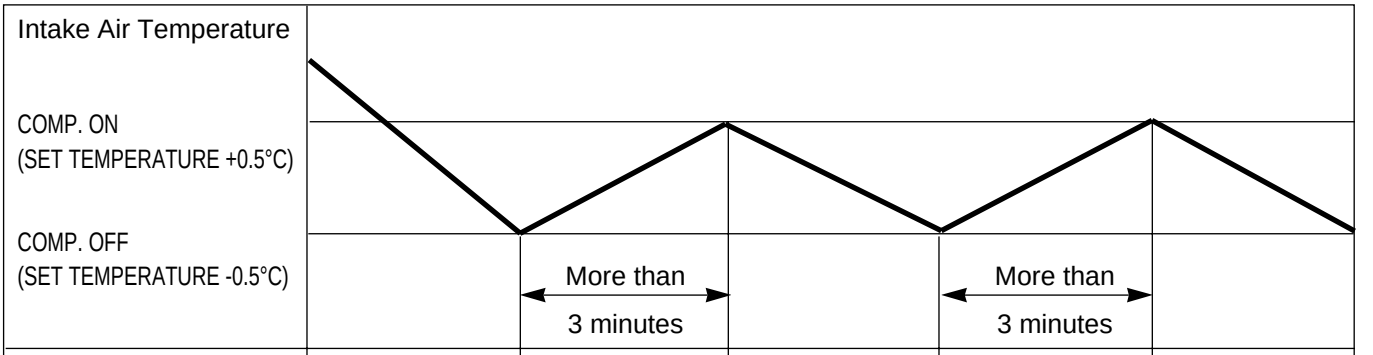


• Airflow direction control figure when installed under the ceiling.



■ Cooling Mode Operation

- When selecting the Cooling( ) Mode Operation, the unit will operate according to the setting by the remote controller and the operation diagram is as following



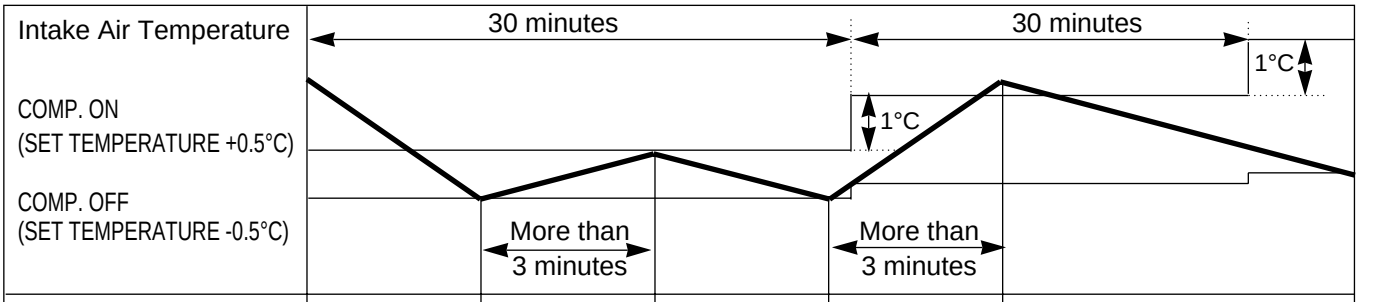
INDOOR FAN	Selecting fan speed	Low	Selecting fan speed	Low	Selecting fan speed
COMPRESSOR	ON	OFF	ON	OFF	ON

■ Cooling or Heating Mode with Sleep Mode Auto Operation

- When selecting the Cooling( ) or the Heating( ) combined with the Sleep Mode Auto Operation( ), the operation diagram is as following.

■ Cooling Mode with the Sleep Mode

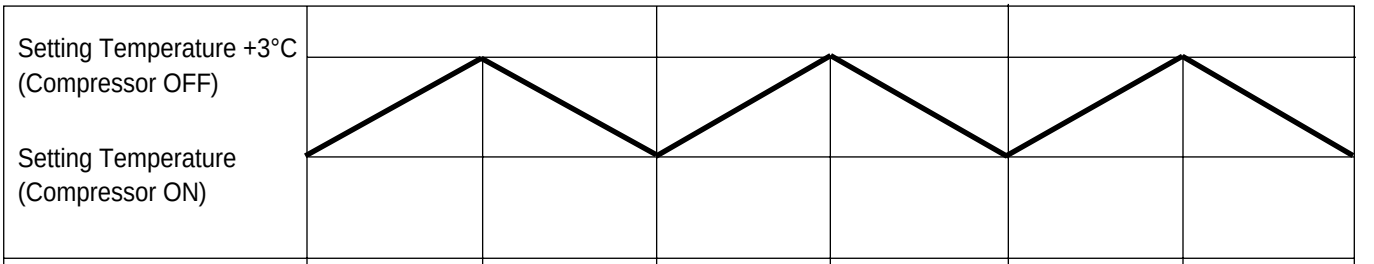
- The setting temperature will be raised by 1°C 30minutes later and by 2°C 1 hour later.
- The operation will be stopped after 1, 2, 3, 4, 5, 6, 7 hours.



INDOOR FAN	Low	Low	Low	Low	Low
COMPRESSOR	ON	OFF	ON	OFF	ON

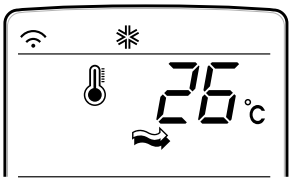
■ Heating Mode with the Sleep Mode.

- The operation will be stopped after 1, 2, 3, 4, 5, 6, 7 hours.

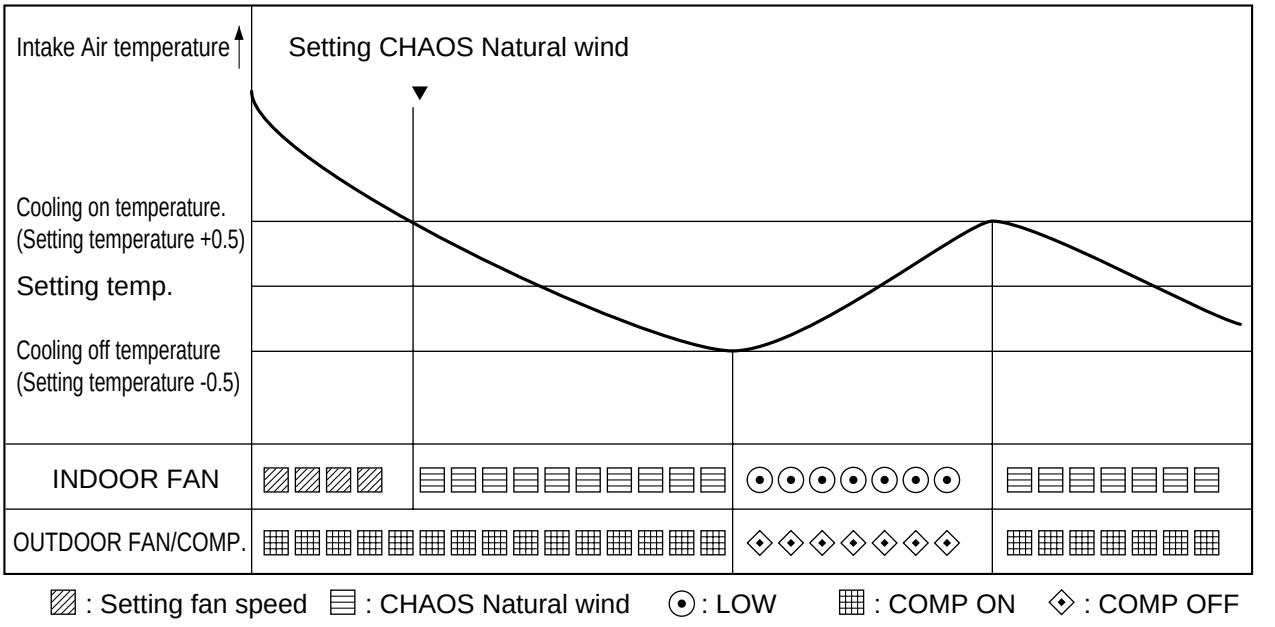


Indoor Fan	Med.	Med.	Med.	Med.	Med.	Med.
Compressor	ON	OFF	ON	OFF	ON	OFF

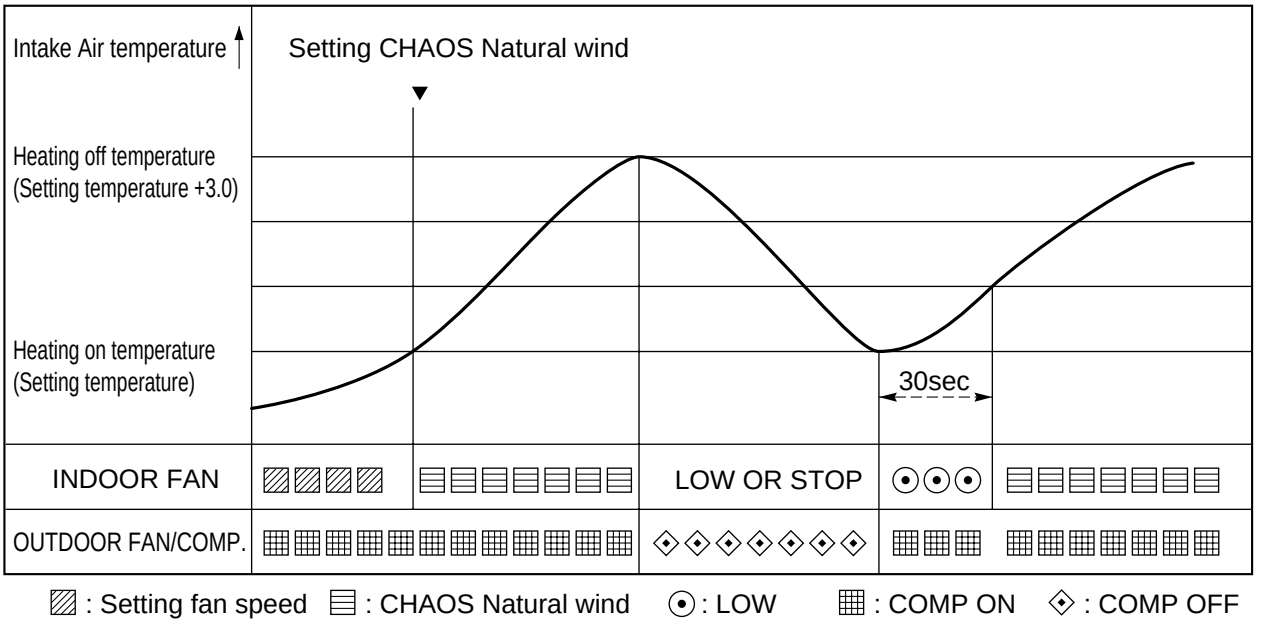
■ Natural wind by CHAOS logic



For more fresh feeling than other fan speed mode, press the indoor fan Speed Selector and set to CHAOS mode. In this mode, the wind blows like natural breeze by automatically changing fan speed according to the CHAOS logic.



GRAPH of Natural wind by the CHAOS logic (During Cooling operation)

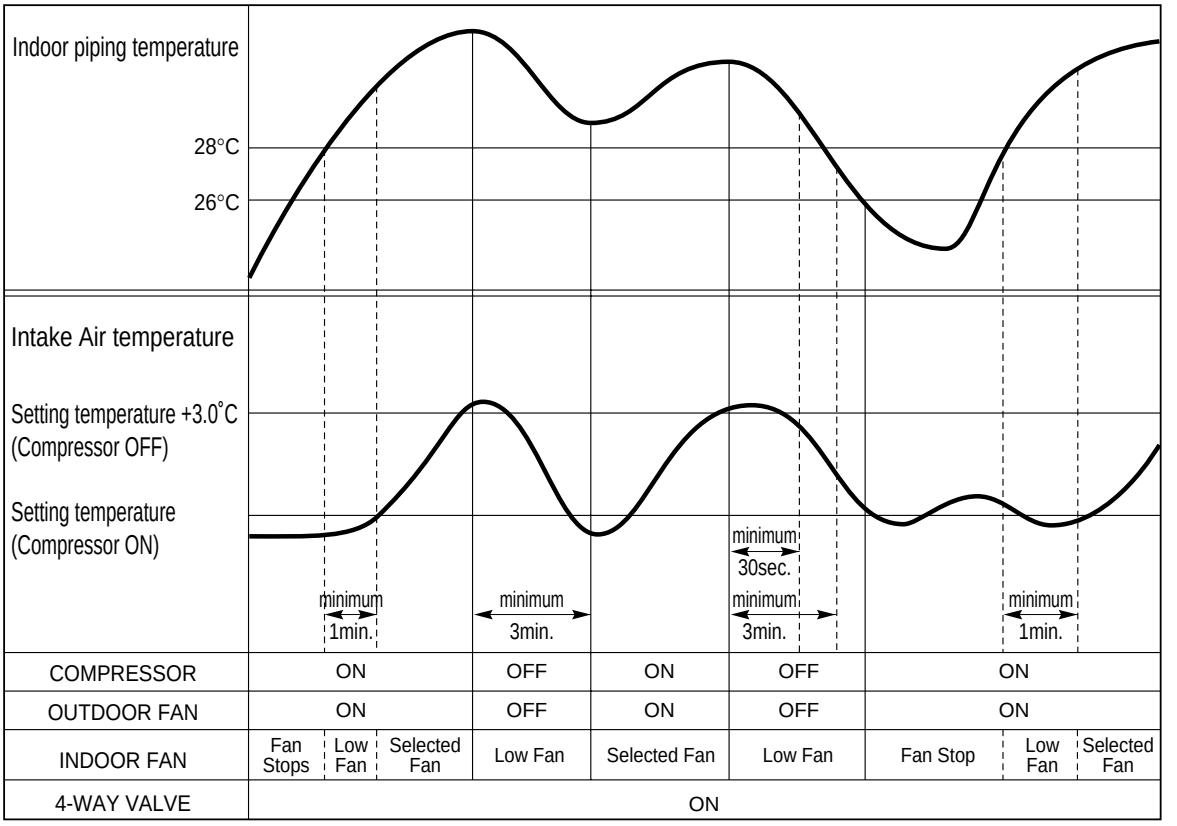


GRAPH of Natural wind by the CHAOS logic (During Heating operation)

■ Heating Mode Operation

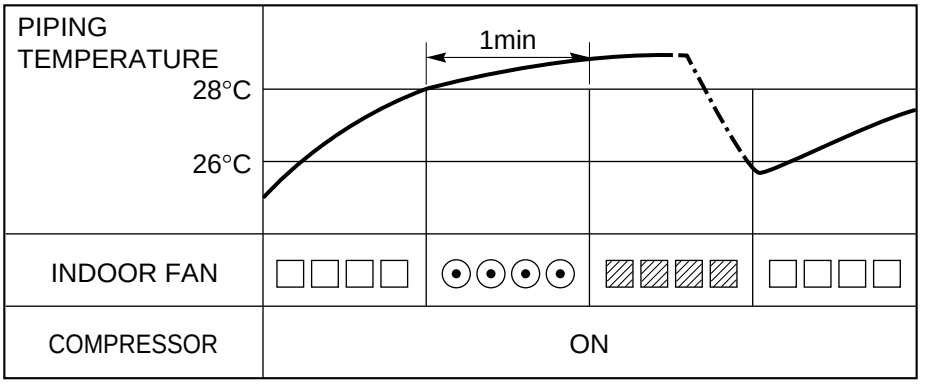
The unit will operate according to the setting by the remote controller and the operation diagram is shown as following.

• For Heating Model



■ Hot-Start Control

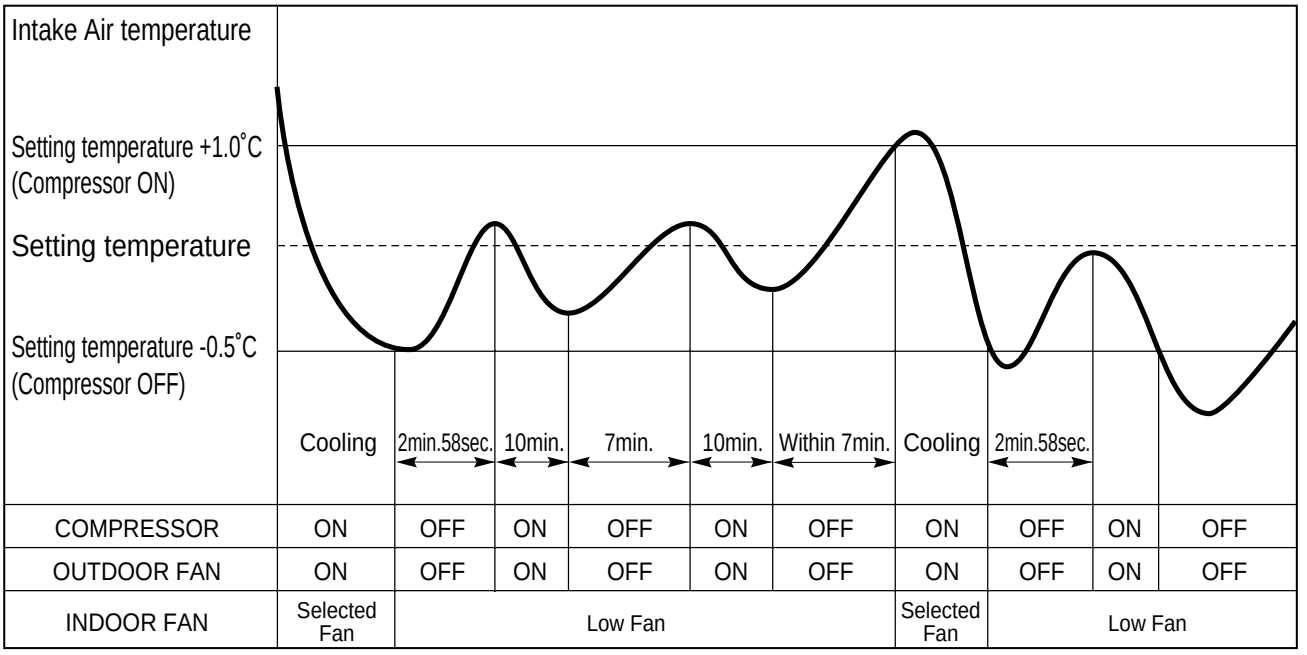
- The indoor fan does not rotate until the evaporator piping temperature will be reached to 22℃.
- During heating operation, if piping temperature falls below 28°C fan stops.
- The operation diagram is as following.



▨ : Selected Fan ⊙ : Low Fan □ : Fan Stop

■ Soft Dry Operation

- During Soft Dry Operation, the compressor ON temperature is the setting temperature plus 1°C, the compressor OFF temperature is the setting temperature minus 0.5°C.
- When the room temperature rises over the compressor ON temperature, the operation mode is switched to the cooling mode.
- When the room temperature falls between the compressor ON temperature and OFF temperature, the operation mode is switched to the Soft Dry Operation.
  In this temperature range, 10min. Dry Operation, 7min operation OFF. During 10min Dry operation, if the room temperature falls below compressor OFF temperature, Compressor OFF.
- In dehumidify mode, control of fan speed is as following.



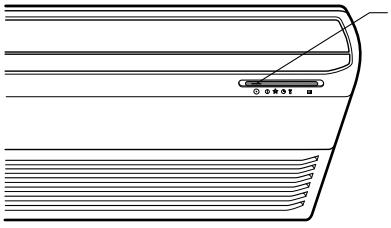
COMPRESSOR	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
OUTDOOR FAN	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
INDOOR FAN	Selected Fan	Low Fan					Selected Fan	Low Fan		

■ Forced operation

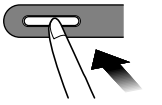
- If you lose wireless remote controller, you can operate the unit with forced operation switch.
- The standard conditions are as following.

	Room Temperature ≥ 24°C	21°C 〈Room Temperature ≤24°C	Room Temperature 〈21°C
Operation Mode	Cooling	Soft Dry	Heating
FAN Speed	High	Soft Dry Rule	High
Setting Temperature	22°C	Air Intake Temperature	24°C

- Unit operates in low fan mode for first 15 seconds, then switched to proper operation mode according to intake Air temperature.



Press the Forced Operation Button.



- Press the Forced Operation Button once again to stop operation.

■ Protection of the evaporator pipe from frosting

If the temperature of the indoor coil is below -2°C after 7 minutes from starting the compressor, the compressor and the outdoor fan is stopped, and then after 3 minute delay of the compressor and the temperature of the indoor coil is over 7°C, the compressor and the outdoor fan is reoperated.
Indoor fan operates at low speed (comp. OFF) or at selected speed (comp. ON)

■ Inlet grille open

Once the inlet grille is opened during operation of the unit, the unit automatically stops operation and the lamps will be turned-off. But memorized functions are still available.
When the inlet grille is closed again, the unit become waiting state for operation. From then, the unit can be operated by forced operation button or Start/Stop button of remote controller.

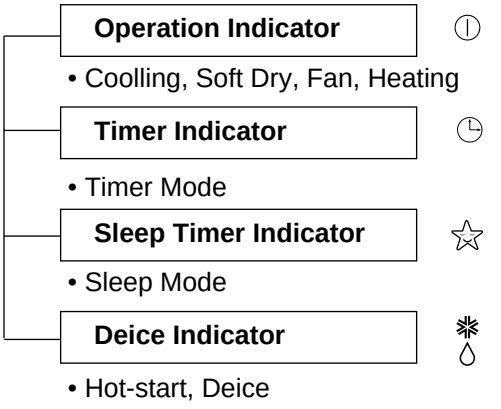
■ Test Operation

- When pressing forced operation switch about 3 seconds, the unit operates in cooling mode at high speed fan regardless of room temperature and resets in 18 min.
- During test operation, if remote controller signal is received, the unit operates as remote controller sets.

■ Auto Restarting Operation

- When the power is restored after a sudden power failure while in appliance is in operation, the mode before the power failure is kept on the memory and the appliance should operate automatically in the mode kept in the memory.
- Operation Mode that is kept on the memory
  - State of Operation ON/OFF
  - Operation Mode/Setting Temperature /Selected airflow Speed
  - Sleep Timer Mode/Remaining Time of Sleep Timer(unit of hour)
- If no input by the remote controller or no switching of the slide switch within 7 hours after the appliance operates by the Auto Restarting operation, the appliance is forced to stop at the moment of 7 hours elapse.

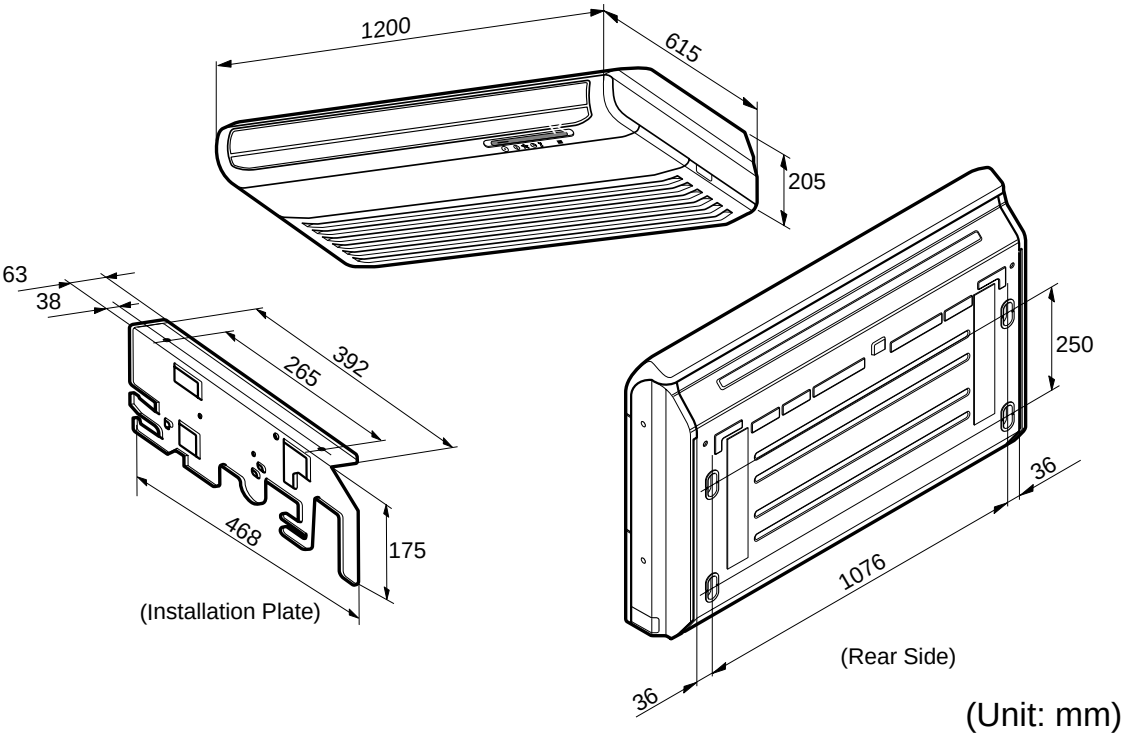
4. Display Function



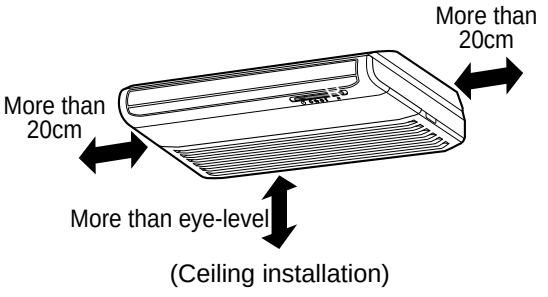
Note)

For normal operation after checking by test mode, you should press SW1 nine times for resetting or reconnect the power cord.

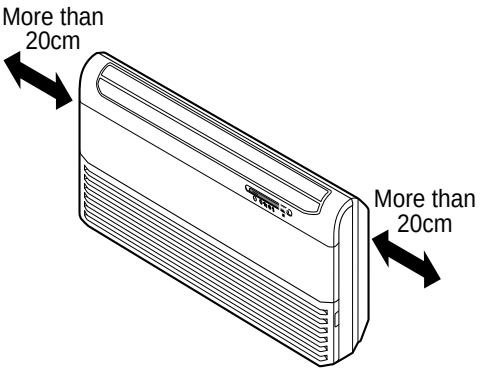
5. Dimensional Drawings



(Unit: mm)

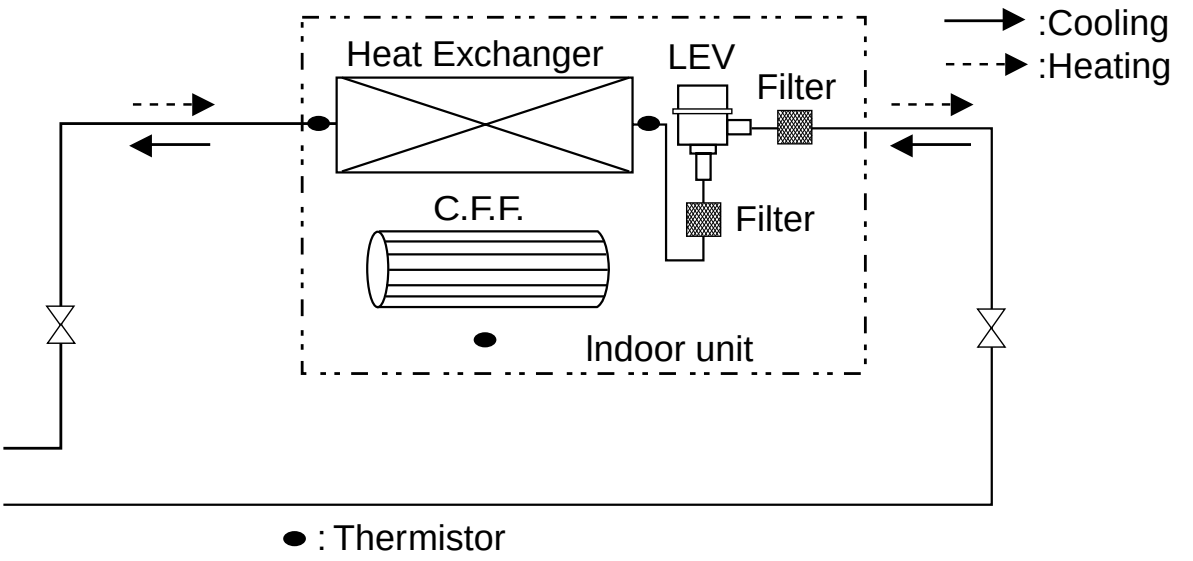


(Ceiling installation)



(Floor/Wall installation)

6. Piping Diagrams

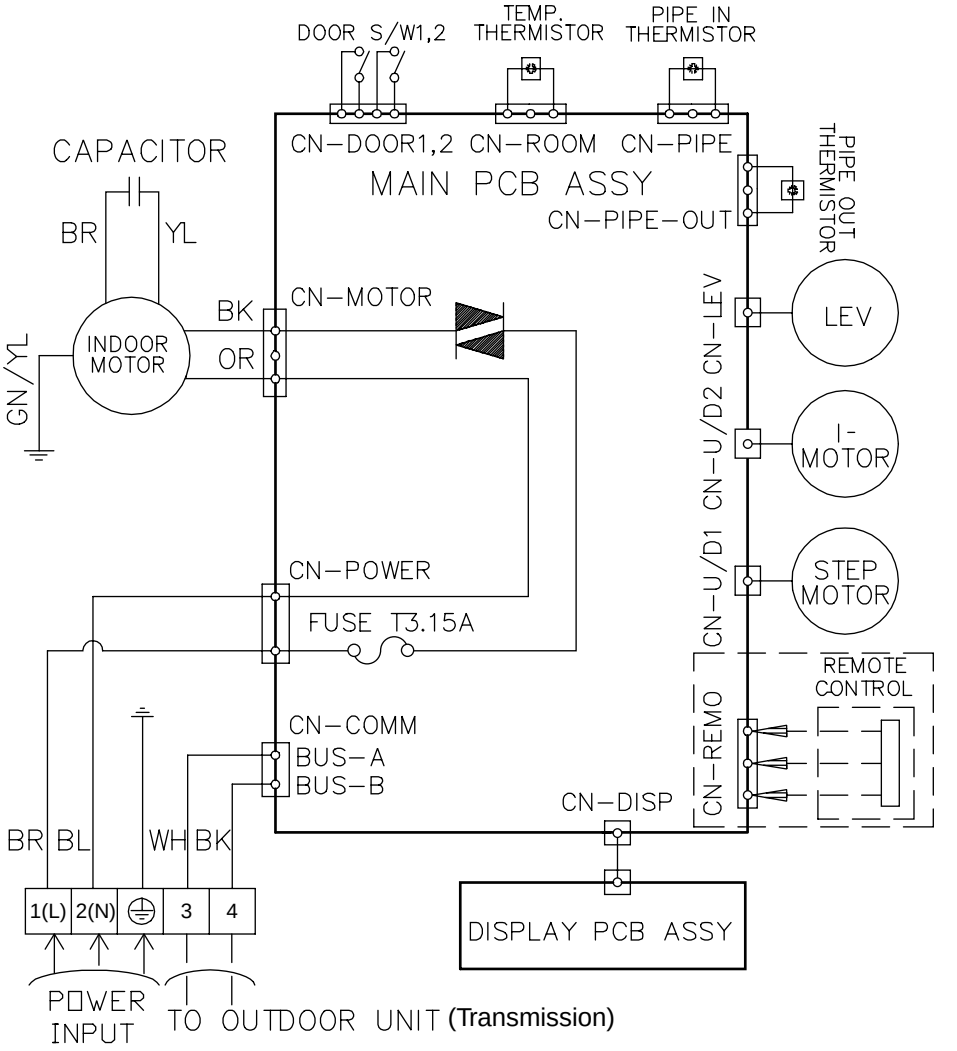


Refrigerant pipe connection port diameter

[unit: mm(inch)]

Model	Gas	Liquid
CRNN186VBA0	15.88(5/8)	9.52(3/8)
CRNN246VBA0		

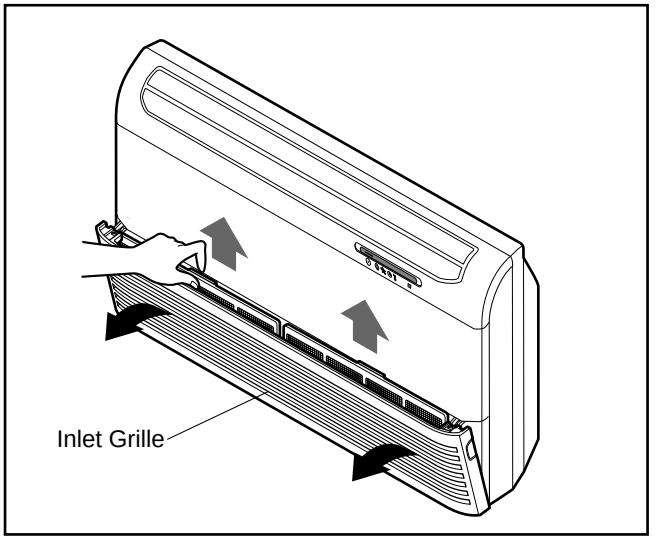
7. Wiring Diagrams



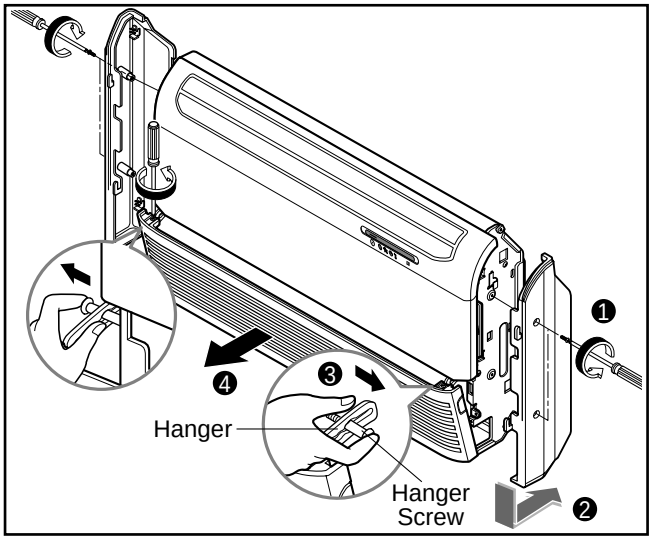
CONNECTOR NUMBER	SPEC	COLOR	DESCRIPTION
CN-POWER	AC POWER SUPPLY	WHITE	AC POWER LINE INPUT FOR INDOOR CONTROLLER
CN-MOTOR2	AC FAN MOTOR OUTPUT	YELLOW	MOTOR OUTPUT OF PHASE CONTROL
CN-COMM	COMMUNICATION	WHITE	COMMUNICATION BETWEEN INDOOR AND OUTDOOR
CN-DISP1	DISPLAY	WHITE	DISPLAY OF INDOOR STATUS
CN-LEV	LEV OUTPUT	WHITE	LEV CONTROL OUTPUT
CN-STEP/M1	STEP MOTOR	WHITE	STEP MOTOR OUTPUT
CN-STEP/M2	STEP MOTOR	WHITE	STEP MOTOR OUTPUT
CN-DOOR	DOOR SENSE	WHITE	SENSING DOOR STATUS(OPEN/CLOSE)
CN-PIPE	PIPE SENSOR	WHITE	PIPE THERMISTOR
CN-PIPE/O	DISCHARGE PIPE SENSOR	RED	DISCHARGE PIPE THERMISTOR
CN-ROOM	ROOM SENSOR	BLUE	ROOM THERMISTOR
CN-REMO	REMOTE CONTROLLER	WHITE	REMOTE CONTROL LINE

8. Disassembly of the parts

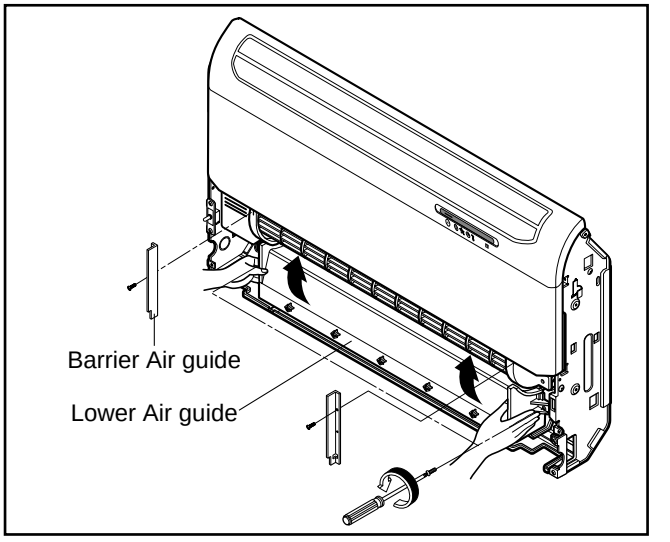
Warning :
Disconnect the unit from power supply before making any checks.
Be sure the power switch is set to “OFF”.



1. Remove the air filter.
- Pull the inlet grille slightly toward you.
- Pull out the air filter. (2 pieces)



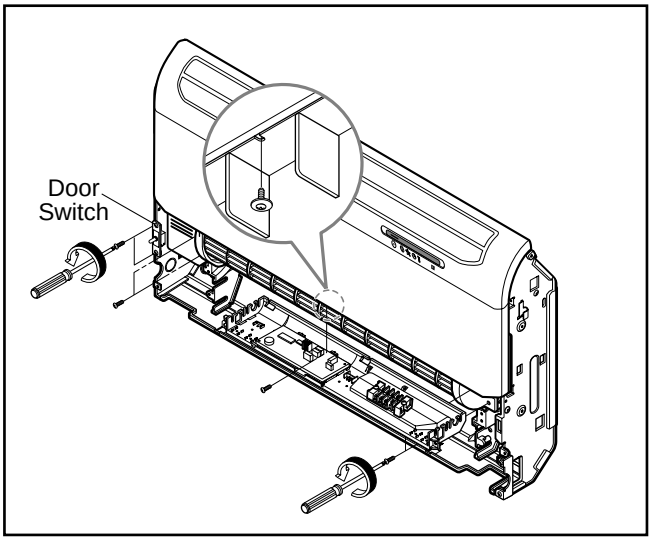
2. Remove the girlle from chassis
- Remove the screws securing the side plate and push to the bottom-side.
- Unhook the hanger from the hanger screw at the left and the right side.
- Pick out the inlet grille.



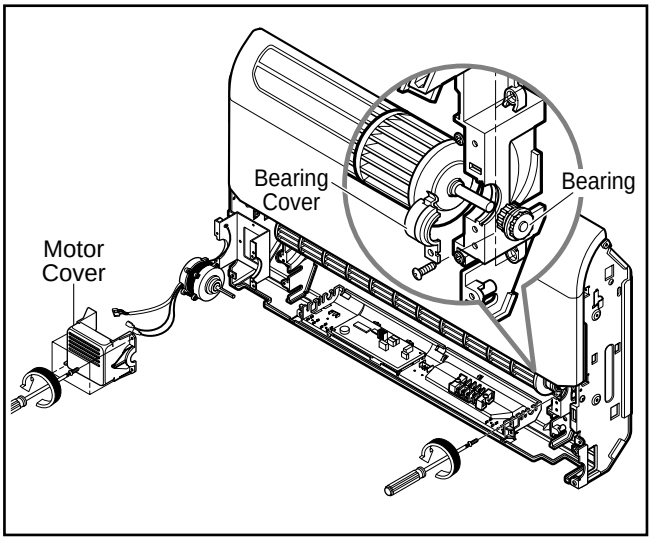
3. Remove the lower air guide
- **Remove a screw of both side fixing "barrier air-guide".**
- **Remove the screws of both sides of the lower air-guide.**
- **Remove the lower air-guide toward “arrow mark” by turning upwards as shown in figure.**

4. Remove air guide upper, crossflow fan and motor.

- Remove the screws of both sides and center securing the upper air-guide.
- Remove 2 screws fastening the bracket of door switch.

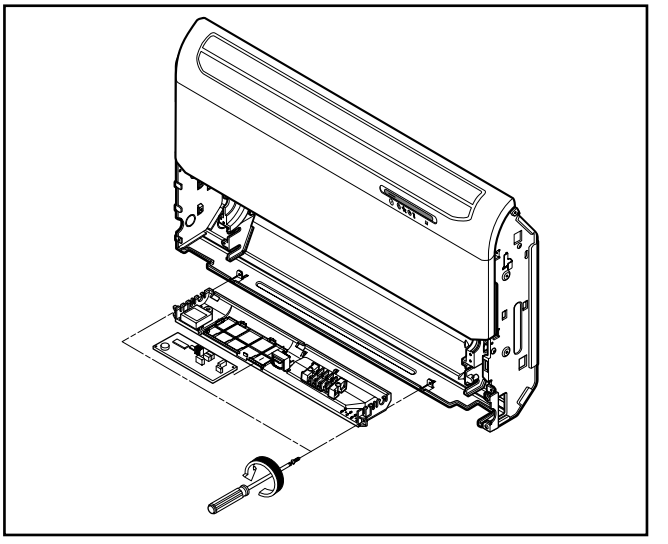


- Remove a bearing assembly by removing a screw and the bearing cover.
- Remove 4 screws securing the motor cover.
- Loosen the screw securing the crossflow fan to the fan motor shaft. (do not remove)
- Remove the crossflow fan by sliding it out from the shaft of fan motor.



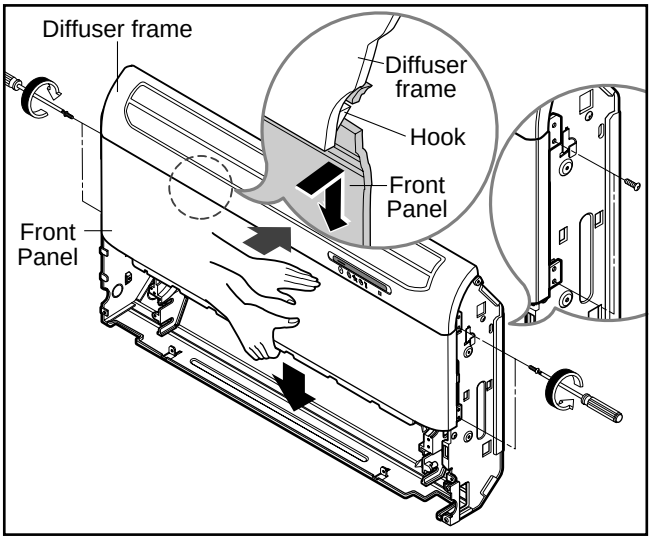
5. Remove the control box Assembly.

- **Disconnect the step motor connector, fan motor connector, display PCB connector, thermistor connector and door switch connector from the main PCB.**
- **If necessary, disconnect power supply cord and connecting cable from the terminal block and remove the cord clamp screw.**
- **Remove 2 screws securing the control box and pick out the control box carefully.**



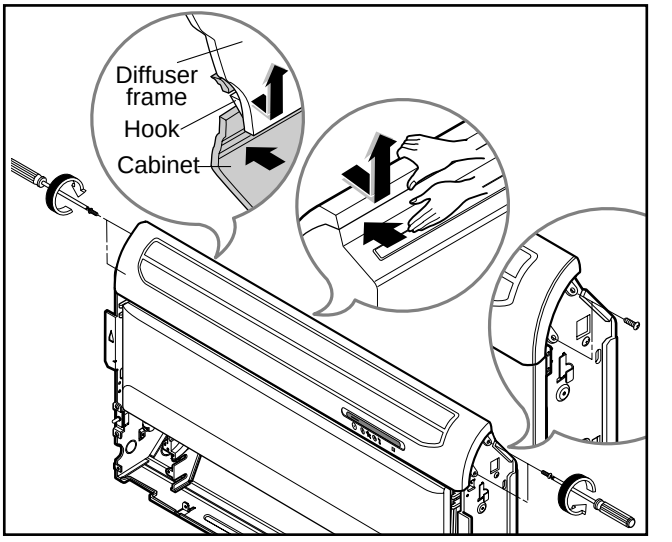
6. Remove the front panel.

- **Remove the screws of both sides fixing the front panel.**
- **Push the upper side of front panel strongly to pull out the front panel from the inner hook of diffuser frame.**
- **Pull down the front panel carefully not so as to harm the display PCB wires and thermistor wires.**



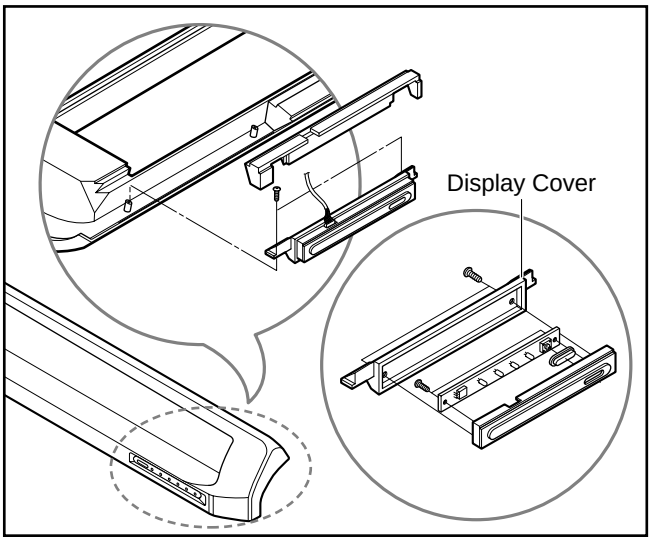
7. Remove the diffuser assembly.

- **Remove the screws of both side of diffuser assembly. (4 pieces)**
- **Push the upper side of cabinet strongly to pull out the inner hook of diffuser frame from the cabinet hole.**
- **Take up the diffuser frame carefully not so as to harm the display PCB wires and the step motor wires.**



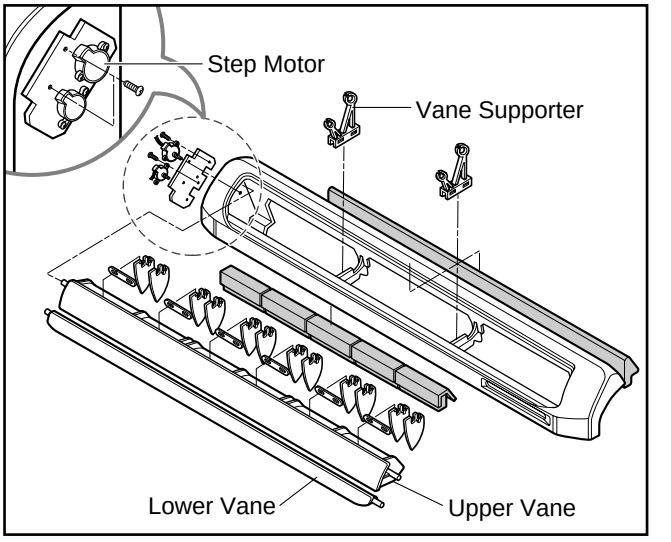
8. Remove display PCB assembly.

- **Remove the screws at the both side of display cover.**
- **If necessary, disconnect the display PCB connector from PCB assembly.**
- **Remove 2 screws of PCB assembly.**



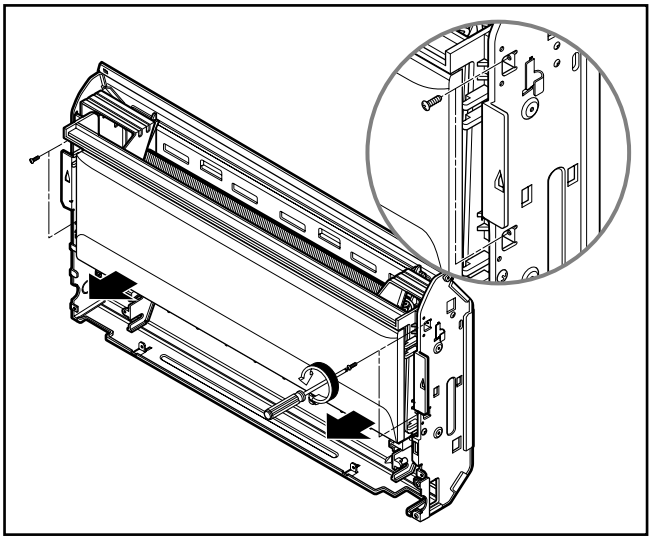
9. Remove the vane-upper, vane-lower and step motor.

- **Remove 2 screws securing the step motor assembly and pull it out from the vanes carefully.**
- **Unhook the vanes from the vane supporter and remove the upper vane and lower vane by pulling the center of vanes with care.**



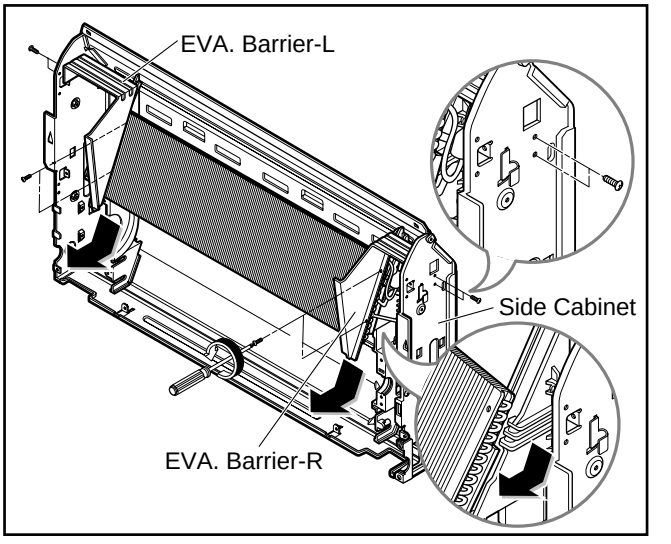
10. Remove the drain pan assembly.

- **Remove the both side of screws. (4 pieces)**
- **Pull out the drain pan assembly.**
- **Be careful not to harm to the EPS packing of drain pan and the tubings of evaporator.**

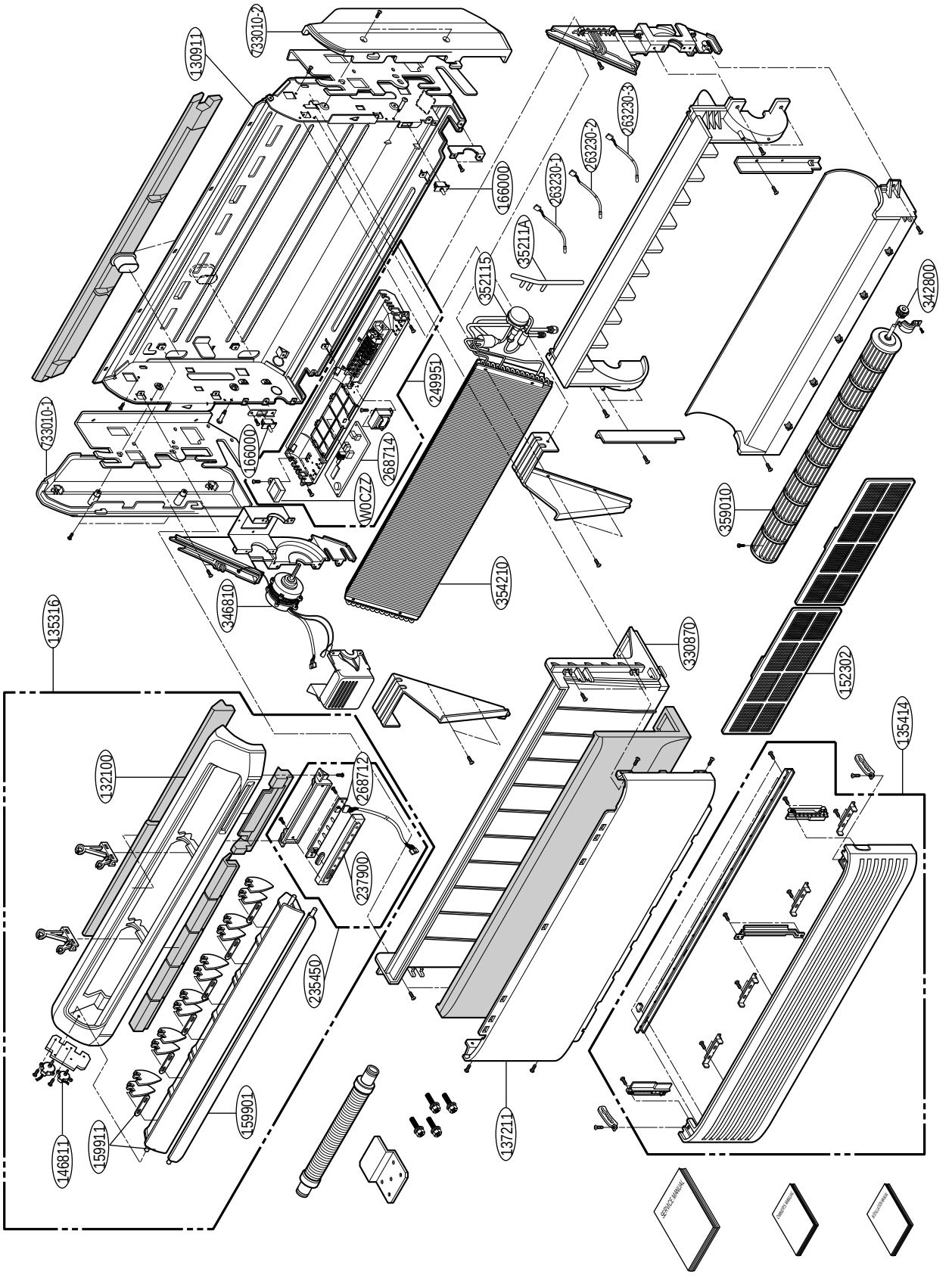


11. Remove the evaporator.

- **Remove the screws of both sides securing the EVA barrier-R/L on the side cabinet.**
- **Remove the screws which fasten the barrier on the evaporator and take out the barrier assembly.**
- **Remove the evaporator assembly by sliding toward arrow mark. (As shown in figure)**



9. Exploded View



10. Replacement Parts List

LOCATION No.	DESCRIPTION	PART NO.		REMARKS
		CRNN186VBA0	CRNN246VBA0	
130911	CABINET ASSEMBLY,INDOOR	3091AP2533A		R
132100	FRAME	3022AP1283B		R
135303	GRILLE,INLET	5236AP1236A		R
135314	GRILLE ASSEMBLY,INLET SUB	5237AP2817B		R
135316	GRILLE ASSEMBLY,DIFFUSER(INDOOR)	3531A10272B		R
137211	PANEL ASSEMBLY,FRONT(INDOOR)	3720AP2767P		R
146811	MOTOR ASSEMBLY,STEP	4681AR2727G		R
152302	FILTER(MECH),A/C	5230AP7093A		R
159901	VANE ASSY	5991AP7334C		R
159911	VANE ASSY,HORIZONTAL	5991AP2867B		R
166000	SWITCH,PUSH	6600AP2059B		R
166000	SWITCH,PUSH	6600AP2059B		R
235450	DISPLAY ASSEMBLY (MECH)	3545AP7224B		R
237900	WINDOW,DISPLAY	3790AP7080A		R
249951	CONTROL BOX ASSEMBLY,INDOOR	4995A10107A	4995A10107D	R
263230-1	THERMISTOR ASSEMBLY(ROOM)	6323AQ3214E		R
263230-2	THERMISTOR ASSEMBLY(PIPE-IN)	6323A30002C		R
263230-3	THERMISTOR ASSEMBLY(PIPE-OUT)	6323AQ3226Y		R
267110	REMOTE CONTROLLER ASSEMBLY	6711A10002A		R
268712	PWB(PCB) ASSY,DISPLAY	6871AQ3263A		R
268714	PWB(PCB) ASSEMBLY,MAIN	6871A10089M	6871A10089R	R
330870	DRAIN PAN ASSEMBLY	3087AP7233A		R
342800	BEARING	3H02821B		R
346810	MOTOR ASSEMBLY,INDOOR	4681AP2306M	4681AP2306N	R
352115	TUBE ASSEMBLY,EVAPORATOR IN	5211A10332A		R
35211A	TUBE ASSEMBLY,SUCTION INDOOR	5211AP2813E	5211AP2813J	R
352150	HOSE ASSY,DRAIN	5251AP2460B		R
354210	EVAPORATOR ASSEMBLY,FIRST	5421AP2812B	5421AP2812A	R
359010	FAN ASSY,CROSS FLOW	5901AR2351E		R
733010	PLATE ASSEMBLY,INSTALL(R)	3301AP7519A		R
733010	PLATE ASSEMBLY,INSTALL(L)	3301AP7519B		R
W0CZZ	CAPACITOR, DRAWING	3H00671A		R

CRNN-SR / CRNN-ST
Wall Mounted Type

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6. Wiring Diagrams 87
7. Disassembly of the parts 88
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9. Replacement Parts List 92

1. Specifications

Model		Unit	CRNN076SRA0	CRNN096SRA0	CRNN126SRA0	CRNN186STA0
Cooling Capacity		W	2,100	2,600	3,500	5,300
		kcal/h	1,806	2,235	3,009	4,557
		Btu/h	7,165	8,871	11,942	18,084
Heating Capacity		W	2,363	2,925	3,938	5,963
		kcal/h	2,031	2,515	3,385	5,127
		Btu/h	8,061	9,980	13,435	20,345
Dimensions (W*H*D)		mm	900*285*156	900*285*156	900*285*156	1090*314*172
		inch	35.4*11.2*6.1	35.4*11.2*6.1	35.4*11.2*6.1	42.9*12.4*6.8
Color			White	White	White	White
Coil	Rows x Columns x FPI		2*12*20	2*12*20	2*12*20	2*13*20
	Face Area	m^2	0.13	0.13	0.13	0.14
Moisture removal		l/h.	1.0	1.0	1.2	2.2
Fan	Type		Cross Flow Fan	Cross Flow Fan	Cross Flow Fan	Cross Flow Fan
	Motor Output x Number	W	7.5	7.5	14.4	22
	Air Flow Rate(High)	cmm	5.6	7.0	9.5	13.5
		cfm	196	247	336	477
	Drive		Direct			
	Speed control		Phase control			
Temperature Control			Microprocessor, Thermostat for cooling and heating			
Sound Absorbing Thermal Insulation Material			Foamed polystyrene			
Air Filter			Resin Net(Washable)			
Safety Device			Fuse	Fuse	Fuse	Fuse
Pipe Connections	Liquid Side	mm(inch)	6.35 (1/4)	6.35 (1/4)	6.35 (1/4)	9.52(3/8)
	Gas Side	mm(inch)	12.7 (1/2)	12.7 (1/2)	12.7 (1/2)	15.88 (5/8)
	Drain Pipe(Internal Dia.)	mm	25	25	25	25
Net Weight		kg(lbs)	7(15.4)	7(15.4)	8(17.6)	12(26.5)
Noise Level (Sound Press,1m, H/M/L)		dBA±3	30/33/27	34/31/28	36/33/30	40/37/34
Power Supply		Ø,V,Hz	1,220~240,50	1,220~240,50	1,220~240,50	1,220~240,50
Power Cable		AWG#:P*mm^2	12:3*2.5	12:3*2.5	12:3*2.5	12:3*2.5
Refrigerant Control			L.E.V	L.E.V	L.E.V	L.E.V
Standard Accessories			Operation Manual, Installation Manual, Installation Panel, Paper Pattern for Installation, Clamps, Screws			

Conversion Formula
kcal/h = kW x 860
Btu/h = kW x 3414
cfm = m^3/min x 35.3

Notes:-

1. Capacities are based on the following conditions:
   - Cooling: - Indoor Temperature 27°C(80.6°F) DB /19°C(66.2°F) WB z
     - Outdoor Temperature 35°C(95°F) DB /24°C(75.2°F) WB
     - Interconnecting Piping Length 7.5m
     - Level Difference of Zero.
   - Heating: - Indoor Temperature 20°C(68°F) DB / 15°C(59°F) WB
     - Outdoor Temperature 7°C(44.6°F) DB / 6°C(42.8°F) WB
     - Interconnecting Piping Length 7.5 m
     - Level Difference of Zero.
2. Capacities are Net Capacities.
3. Due to our policy of innovation some specifications may be changed without notification.
4. L.E.V. : Linear Expansion Valve

2. Functions

Indoor Unit

Operation ON/OFF by Remote controller

Sensing the Room Temperature

• Room temperature sensor. (THERMISTOR)

Room temperature control

• Maintains the room temperature in accordance with the Setting temperature

Starting Current Control

• Indoor fan is delayed for 5 seconds at the starting.

Time Delay Safety Control

• Restarting is inhibited for approx. 3 minutes.

Indoor Fan Speed Control

• High, Med, Low, Chaos

Operation indication Lamps (LED)

--- Lights up in operation

--- Lights up in Sleep Mode

--- Lights up in Timer Mode

--- Lights up in Deice Mode

88 --- Indicate the setting temperature.

Health Dehumidification Operation

• Intermittent operation of fan at low speed.

Sleep Mode Auto Control

• The fan is switched to low(Cooling), med(Heating) speed.
• The unit will be stopped after 1, 2, 3, 4, 5, 6, 7 hours.

Natural Air Control by CHAOS Logic

• The fan is switched to intermittent or irregular operation
• The fan speed is automatically switched from high to low speed.

Airflow Direction Control

• The louver can be set at the desired position or swing up and down automatically.

Auto Restart

• Although the air conditioner is turned off by a power failure, it is restarted automatically to previous operation mode after power suply.

Deice (defrost) control (Heating)

• Both the indoor and outdoor fan stops during deicing.
• Hot start after deice ends.

Hot-start Control (Heating)

• The indoor fan does not rotate until the evaporator piping temperature will be reached at 28°C.

3. Operation Details

(1) The function of main control

• DISPLAY

Operation Indicator

• On while in appliance operation, off while in appliance pause

Sleep Timer Indicator

• On while in sleep timer mode, off when sleep timer cancel or appliance operation pause

Timer Indicator

• On while in timer mode (on/off), off when timer mode is completed or canceled

Defrost Indicator

• Off except when hot start during heating mode operation or while in defrost control

■ Cooling Mode Operation

• When the intake air temperature reaches 0.5°C below the setting temperature, the compressor and the outdoor fan stop.
• When it reaches 0.5°C above the setting temperature, they start to operate again.
Compressor ON Temperature ➲ Setting Temperature +0.5°C
Compressor OFF Temperature ➲ Setting Temperature -0.5°C
• While in compressor running, operating with the airflow speed set by the remote control. While in compressor not running, operating with the low airflow speed regardless of the setting.

■ Soft Dry Operation Mode

• When the dehumidification operation input by the remote control is received, the intake air temperature is detected and the setting temperature is automatically set according to the intake air temperature.
26°C ≤ Intake Air Temperature ➲ 25°C
24°C ≤ Intake Intake Air Temperature <26°C ➲ Intake Air Temperature -1°C
18°C ≤ Intake Intake Air Temperature <24°C ➲ Intake Air Temperature -0.5°C
Intake Air Temperature <18°C ➲ 18°C
• While in compressor off, the indoor fan repeats low airflow speed and pause.
• While the intake air temperature is between compressor on temperature and compressor off temperature, 10-min dehumidification operation and 4-min compressor off repeat.
Compressor ON temperature ➲ Setting Temperature +0.5°C
Compressor OFF temperature ➲ Setting Temperature -0.5°C
• In 10-min dehumidification operation, the indoor fan operates with the low airflow speed.

■ Heating Mode Operation

• When the intake air temperature reaches +3°C above the setting temperature, the compressor is turned off. When below the setting temperature, the compressor is turned on.
Compressor ON temperature ➲ Setting temperature
Compressor OFF temperature ➲ Setting temperature+3°C
• While in compressor on, the indoor fan is off when the indoor pipe temperature is below 26°C, when above 28°C , it operates with the low or setting airflow speed.

- While in compressor off, the indoor fan is off when the indoor pipe temperature is below 33°C, when above 35°C , it operates with the low airflow speed.
- If overloaded while in heating mode operation, in order to prevent the compressor from OLP operation, the outdoor fan is turned on/off according to the indoor pipe temperature
- While in defrost control, both of the indoor and outdoor fans are turned off.

■ Fuzzy Operation

- When any of operation mode is not selected like the moment of the power on or when 3 hrs has passed since the operation off, the operation mode is selected.
- When determining the operation mode, the compressor, the outdoor fan, and the 4 way valve are off and only the indoor fan is operated for 15 seconds. Then an operation mode is selected according to the intake air temperature at that moment as follows.

  24°C ≤ Inatake Air Temperature ➲ Fuzzy Operation for Cooling
  21°C ≤ Inatake Air Temperature <24°C ➲ Fuzzy Operation for Dehumidification
  Inatake Air Temperature <21°C ➲ Fuzzy Operation for Heating
- If any of the operation modes among cooling / dehumidification / heating mode operations is carried out for 10 sec or longer before Fuzzy operation, the mode before Fuzzy operation is operated.

1) Fuzzy Operation for Cooling

- According to the setting temperature selected by Fuzzy rule, when the intake air temperature is 0.5°C or more below the setting temperature, the compressor is turned off. When 0.5°C or more above the setting temperature, the compressor is turned on.

  Compressor ON Temperature ➲ Setting Temperature +0.5°C
  Compressor OFF Temperature ➲ Setting Temperature – 0.5°C
- At the beginning of Fuzzy mode operation, the setting temperature is automatically selected according to the intake air temperature at that time.

  26°C≤ Intake Air Temperature ➲ 25°C
  24°C≤ Intake Air Temperature <26°C ➲ Intake Air Temperature – 1°C
  22°C≤ Intake Air Temperature <24°C ➲ Intake Air Temperature – 0.5°C
  18°C≤ Intake Air Temperature <22°C ➲ Intake Air Temperature
  Intake Air Temperature <18°C ➲ 18°C
- When the Fuzzy key (Temperature Control key) is input after the initial setting temperature is selected, the Fuzzy key value and the intake air temperature at that time are compared to select the setting temperature automatically according to the Fuzzy rule.
- While in Fuzzy operation, the airflow speed of the indoor fan is automatically selected according to the temperature.

2) Fuzzy Operation for Dehumidification

- According to the setting temperature selected by Fuzzy rule, when the intake air temperature is 0.5°C or more below the setting temperature, the compressor is turned off. When 0.5°C or more above the setting temperature, the compressor is turned on.
  Compressor ON Temperature ➲ Setting Temperature + 0.5°C
  Compressor OFF Temperature ➲ Setting Temperature – 0.5°C
- At the beginning of Fuzzy mode operation, the setting temperature is automatically selected according to the intake air temperature at that time.
  26°C ≤ Intake Air Temperature ➲ 25°C
  24°C ≤ Intake Air Temperature <26°C ➲ Intake Air Temperature – 1°C
  22°C ≤ Intake Air Temperature <24°C ➲ Intake Air Temperature – 0.5°C
  18°C ≤ Intake Air Temperature <22°C ➲ Intake Air Temperature
  Intake Air Temperature <18°C ➲ 18°C
- When the Fuzzy key (Temperature Control key) is input after the initial setting temperature is selected, the Fuzzy key value and the intake air temperature at that time are compared to select the setting temperature automatically according to the Fuzzy rule.
- While in Fuzzy operation, the airflow speed of the indoor fan repeats the low airflow speed or pause as in dehumidification operation.

3) Fuzzy Operation for Heating

- According to the setting temperature selected by Fuzzy rule, when the intake air temperature is 3°C or more above the setting temperature, the compressor is turned off. When below the setting temperature, the compressor is turned on.
  Compressor ON Temperature ➲ Setting Temperature
  Compressor OFF Temperature ➲ Setting Temperature + 3°C
- At the beginning of Fuzzy mode operation, the setting temperature is automatically selected according to the intake air temperature at that time.
  20°C≤Intake Air Temperature ➲ Intake Air Temperature + 0.5°C
  Intake Air Temperature <20°C ➲ 20°C
- When the Fuzzy key (Temperature Control key) is input after the initial setting temperature is selected, the Fuzzy key value and the intake air temperature at that time are compared to select the setting temperature automatically according to the Fuzzy rule.
- While in Fuzzy operation, the airflow speed of the indoor fan is set to the high or the medium according to the intake air temperature and the setting temperature.

■ Airflow Speed Selection

- The airflow speed of the indoor fan is set to high, medium, low, or chaos (auto) by the input of the airflow speed selection key on the remote control.

■ On-Timer Operation

- When the set time is reached after the time is input by the remote control, the appliance starts to operate.
- The timer LED is on when the on-timer is input. It is off when the time set by the timer is reached.
- If the appliance is operating at the time set by the timer, the operation continues.

While in Fuzzy operation, the airflow speed of the indoor fan is automatically selected according to the temperature.

■ Off-Timer Operation

- When the set time is reached after the time is input by the remote control, the appliance stops operating.
- The timer LED is on when the off-timer is input. It is off when the time set by the timer is reached.
- If the appliance is on pause at the time set by the timer, the pause continues.

■ Off-Timer <=> On-Timer Operation

- When the set time is reached after the on/off time is input by the remote control, the on/off-timer operation is carried out according to the set time.

■ Sleep Timer Operation

- When the sleep time is reached after < 1,2,3,4,5,6,7,0(cancel) hour > is input by the remote control while in appliance operation, the operation of the appliance stops.
- While the appliance is on pause, the sleep timer mode cannot be input.
- While in cooling mode operation, 30 min later since the start of the sleep timer, the setting temperature increases by 1°C. After another 30 min elapse, it increases by 1°C again.
- When the sleep timer mode is input while in cooling cycle mode, the airflow speed of the indoor fan is set to the low.
- When the sleep timer mode is input while in heating cycle mode, the airflow speed of the indoor fan is set to the medium.

■ Chaos Swing Mode

- By the Chaos Swing key input, the upper/lower vane automatically operates with the Chaos Swing or they are fixed to the desired direction.
- While in Chaos Swing mode, the angles of cooling and heating cycle operations are different.

■ Chaos Natural Wind Mode

- When the Chaos Natural Wind mode is selected and then operated, the high, medium, or low speed of the airflow mode is operated for 2~15 sec. randomly by the Chaos Simulation.

■ Jet Cool Mode Operation

- While in heating mode or Fuzzy operation, the Jet Cool key cannot be input. When it is input while in the other mode operation (cooling, dehumidification, ventilation), the Jet Cool mode is operated.
- In the Jet Cool mode, the indoor fan is operated at super-high speed for 30 min at cooling mode operation.
- In the Jet Cool mode operation, the room temperature is controlled to the setting temperature, 18°C.
- When the sleep timer mode is input while in the Jet Cool mode operation, the Jet Cool mode has the priority.
- When the Jet Cool key is input, the upper/lower vanes are reset to those of the initial cooling mode and then operated in order that the air outflow could reach further.

■ Auto restart

- In case the power comes on again after a power failure, Auto Restarting Operation is the function to operate procedures automatically to the previous operating conditions.

■ Forced Operation

- Operation procedures when the remote control can't be used.
- The operation will be started if the power button is pressed.
- If you want to stop operation, re-press the button.

	Room temperature ≥ 24°C	**21°C ≤ Room temperature < 24°C**	**Room temperature < 21°C**
Operating mode	Cooling	Healthy Dehumidification	Heating
Indoor FAN Speed	High	High	High
Setting Temperature	22°C	23°C	24°C

- While in forced operation, the key input by the remote control has no effect and the buzzer sounds 10 times to indicate the forced operation.

■ Test operation

- During the TEST OPERATION, the unit operates in cooling mode at high speed fan, regardless of room temperature and resets in 18±1 minutes.
- During test operation, if remote controller signal is received, the unit operates as remote controller sets. If you want to use this operation, open the front panel upward and Press the power button let it be pressed for about 3 seconds.
- If you want to stop the operation, re-press the button.

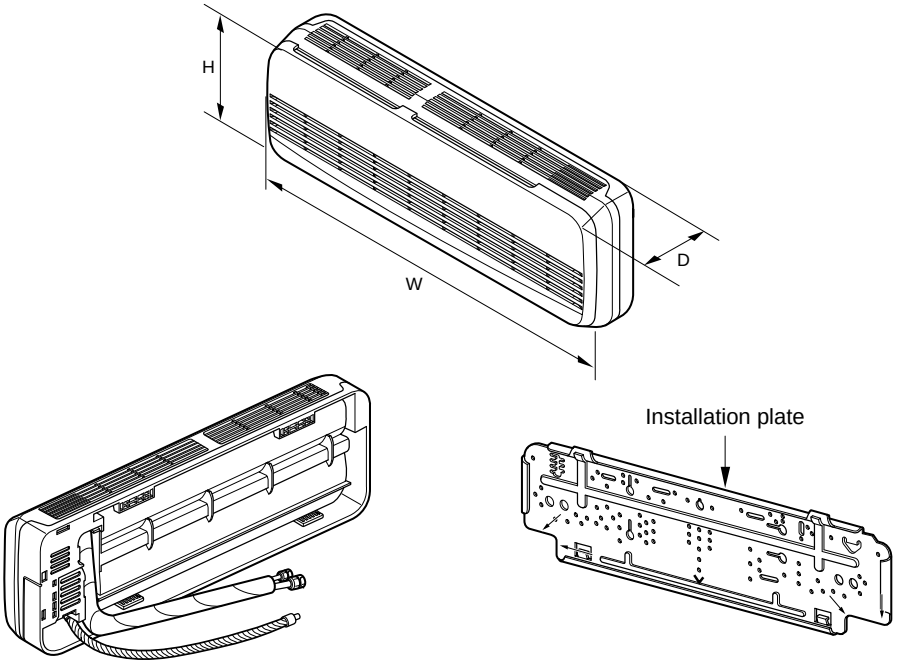
■ Protection of the evaporator pipe from frosting

- If the indoor pipe temperature is below 0°C in 7 min. after the compressor operates without any pause while in cooling cycle operation mode, the compressor and the outdoor fan are turned off in order to protect the indoor evaporator pipe from frosting.
- When the indoor pipe temperature is 7°C and higher after 3 min. pause of the compressor, the compressor and the outdoor fan is turned on according to the condition of the room temperature.

■ Buzzer Sounding Operation

- When the appliance-operation key is input by the remote control, the short "beep-beep-" sounds.
- When the appliance-pause key is input by the remote control, the long "beep—" sounds.

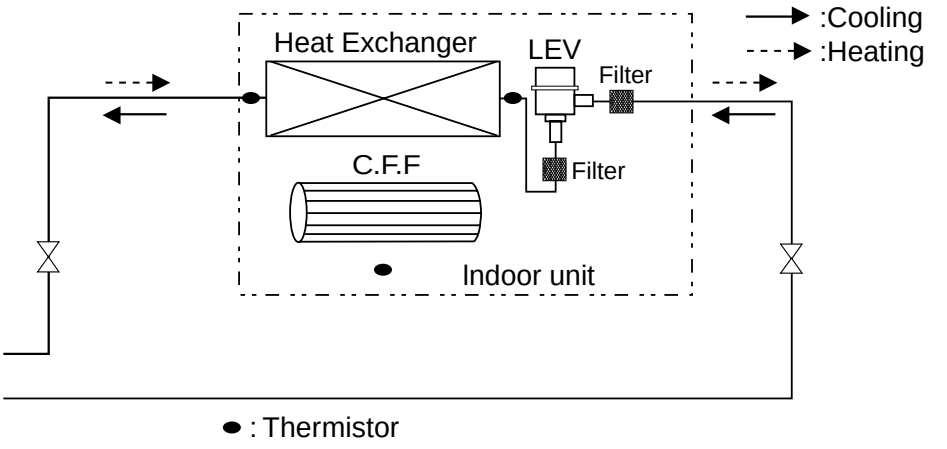
4. Dimiensional Drawings



(Unit : mm)

Model No.	W	H	D
CRNN076SRA0	900	285	156
CRNN096SRA0			
CRNN126SRA0			
CRNN186STA0	1090	314	172

5. Piping Diagrams

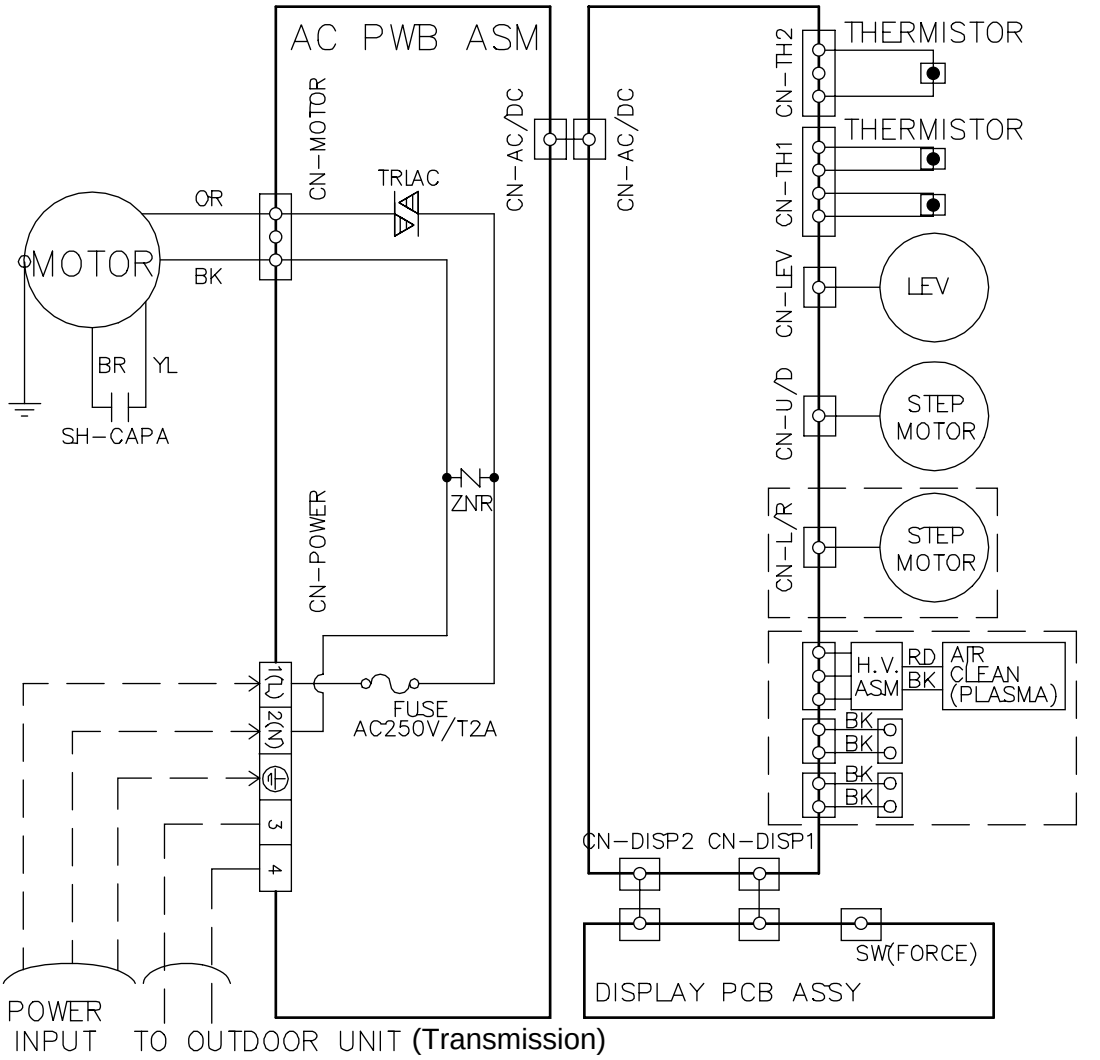


Refrigerant pipe connection port diameter

[unit: mm(inch)]

Model	Gas	Liquid
CRNN076SRA0	12.7(1/2)	6.35(1/4)
CRNN096SRA0		
CRNN126SRA0		
CRNN186STA0	15.88(5/8)	9.52(3/8)

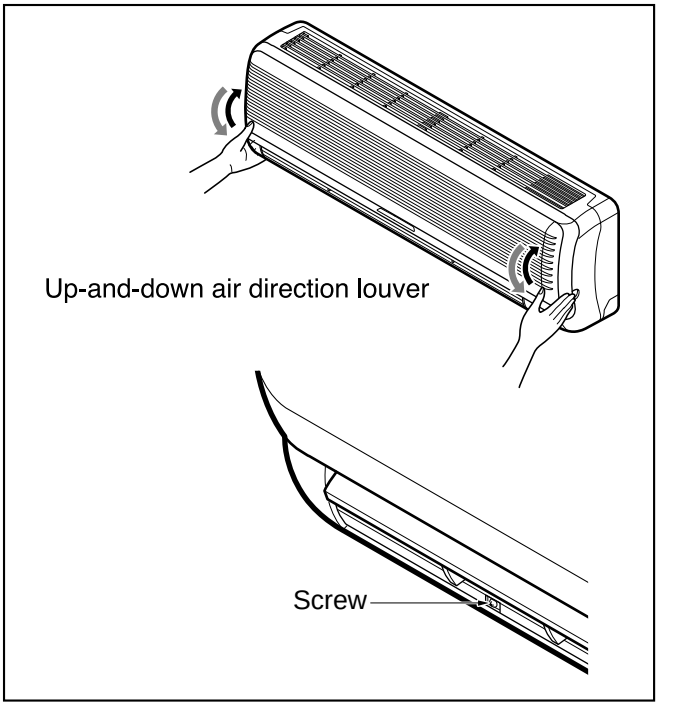
6. Wiring Diagrams



CONNECTOR NUMBER	SPEC	COLOR	DESCRIPTION
CN-POWER	AC POWER SUPPLY	WHITE	AC POWER LINE INPUT FOR INDOOR CONTROLLER
CN-MOTOR2	AC FAN MOTOR OUTPUT	YELLOW	MOTOR OUTPUT OF PHASE CONTROL
CN-ACDC	AC/DC CONNECTION	WHITE	CONNECTION BETWEEN AC PCB AND DC PCB
CN-COMM	COMMUNICATION	WHITE	COMMUNICATION BETWEEN INDOOR AND OUTDOOR
CN-DISP1	DISPLAY	BLUE	DISPLAY OF INDOOR STATUS
CN-DISP2	DISPLAY	WHITE	DISPLAY OF INDOOR STATUS
CN-LEV	LEV OUTPUT	WHITE	LEV CONTROL OUTPUT
CN-UD	STEP MOTOR	WHITE	STEP MOTOR OUTPUT
CN-TH1	ROOM/PIPE SENSOR	WHITE	ROOM & PIPE THERMISTOR
CN-PIPEOUT	DISCHARGE PIPE SENSOR	RED	DISCHARGE PIPE THERMISTOR

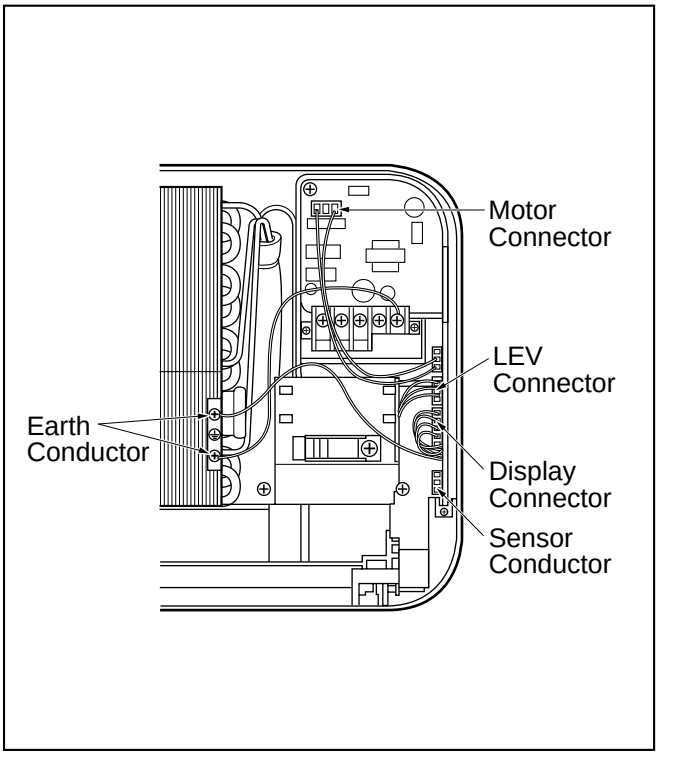
7. Disassembly of the parts

Warning :
Disconnect the unit from power supply before making any checks.
Be sure the power switch is set to “OFF”.



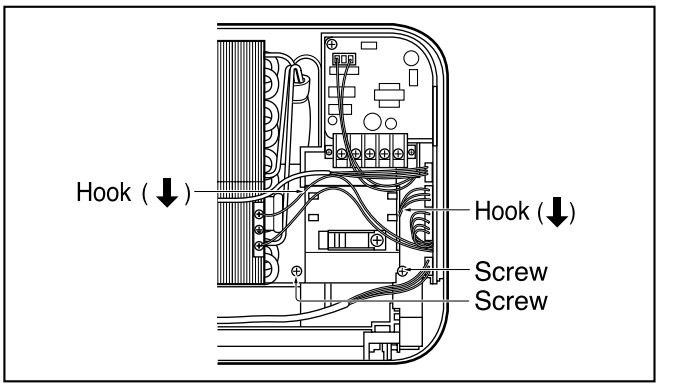
To remove the Grille from the Chassis.
- Set the up-and-down air discharge louver to open position (horizontally) by finger pressure.
- Remove the securing screws
- To remove the Grille, pull the lower left and right side of the grille toward you (slightly tilted) and lift it straight upward.

1. To remove the sensor, housing connect, earth connector & step motor connector with sensor holder, Motor, Evaporator & P.C.B.



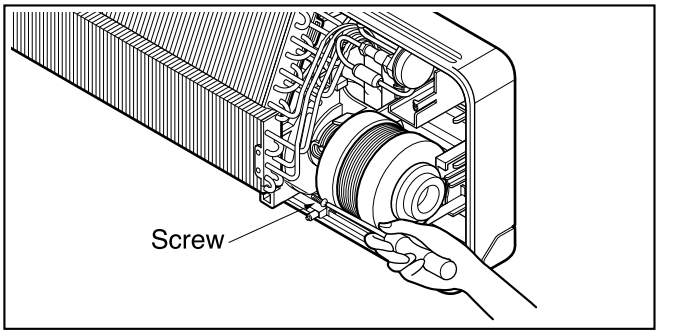
2. To remove the Control Box.

- **Remove securing screws.**
- **Pull the control box out from the chassis carefully.**



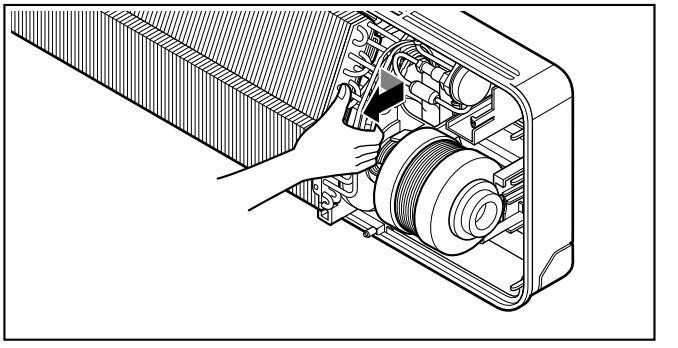
3. To remove the Discharge Grille.

- **Pull the discharge grille out from the chassis carefully.**



4. To remove the Evaporator.

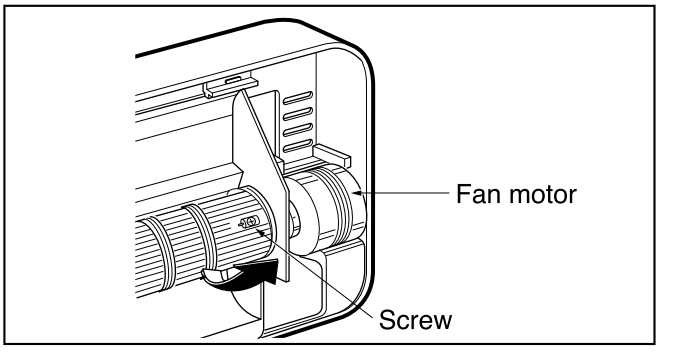
- **Remove screws securing the evaporator and the holder eva.**



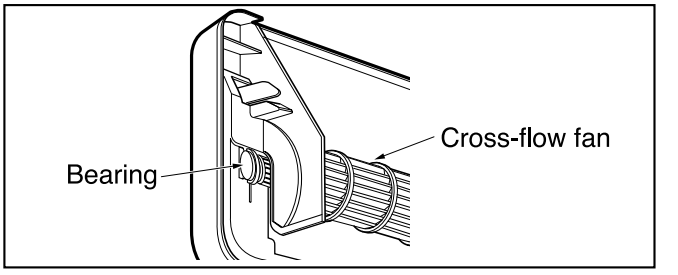
- **Unhook the tab on the right inside of the chassis at the same time, slightly pull the evaporator toward you until the tab is clear of the slot.**

5. To remove the Cross-Flow Fan

- **Loosen the screw securing the cross-flow fan to the fan motor (do not remove).**
- **Lift up the right side of the cross-flow fan and the fan motor, separate the fan motor from the cross-flow fan.**

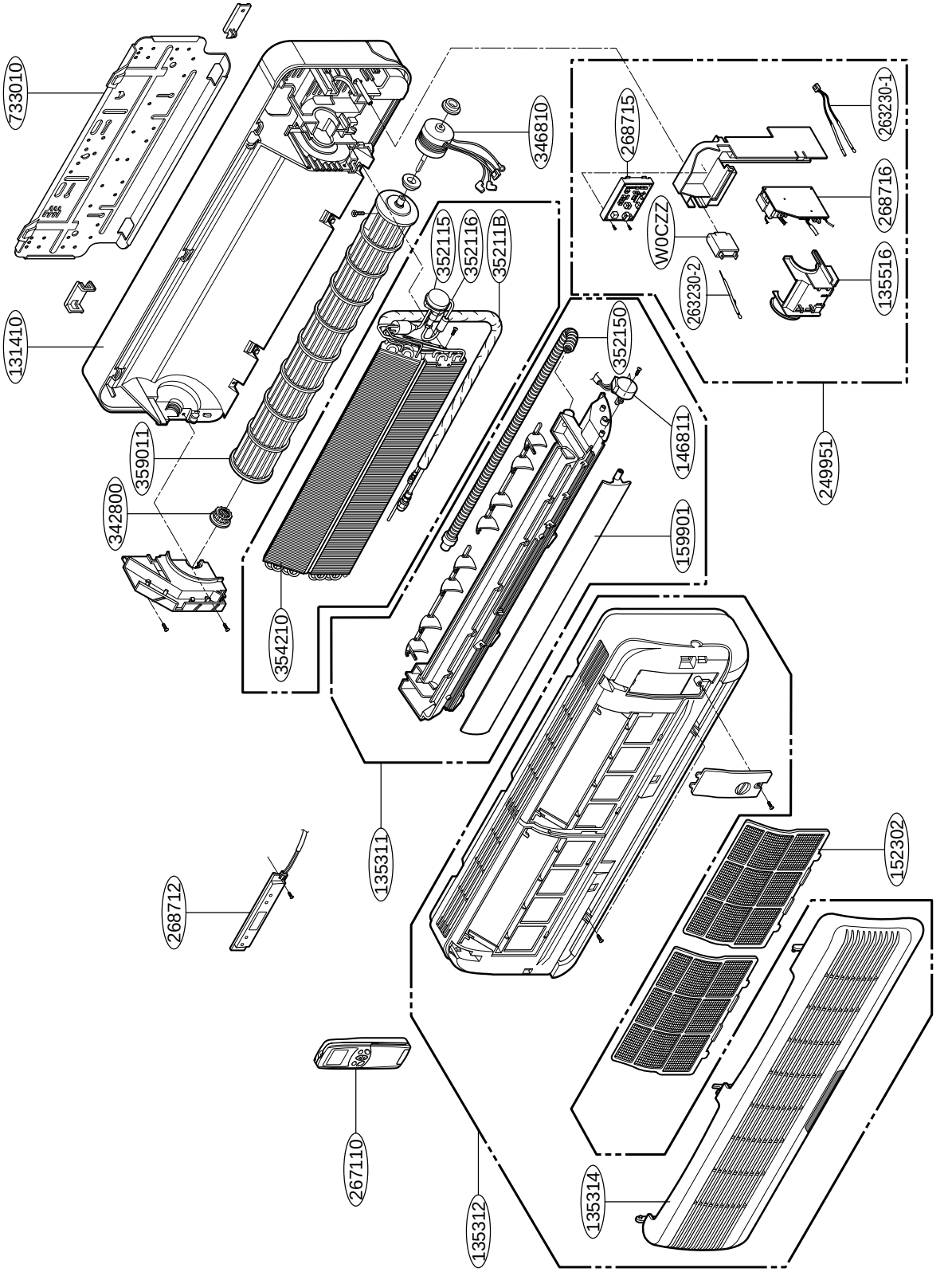


- **Remove the left end of the cross-flow fan from the self-aligning bearing.**

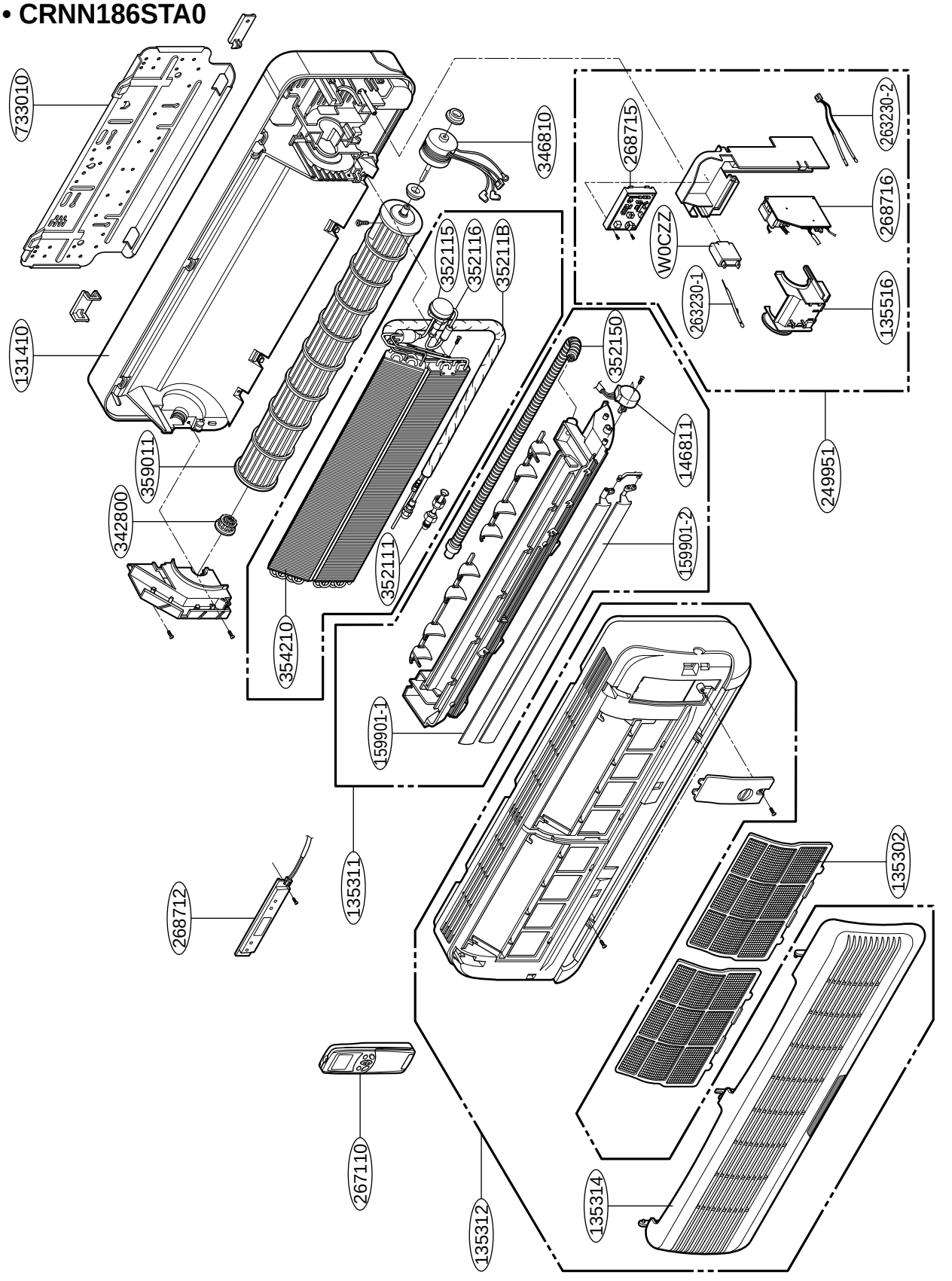


8. Exploded View

• CRNN076SRA0, CRNN096SRA0, CRNN126SRA0



• **CRNN186STA0**



9. Replacement Parts List

Location No.	Description	Part No.			Remarks
		CRNN076SRA0	CRNN096SRA0	CRNN126SRA0	
131410	CHASSIS ASSEMBLY	3141A20005E			R
135311	GRILLE ASSEMBLY,DISCHARGE(INDOOR)	3531A10192E			R
135312	GRILLE ASSEMBLY,FRONT(INDOOR)	3531A10118W			R
135516	COVER ASSEMBLY,MOTOR	3551A20050A			R
146811	MOTOR ASSEMBLY,STEP	4681A20055A			R
152302	FILTER(MECH),A/C	5230A20014A			R
159901	VANE,HORIZONTAL	5990A20007A			R
249951	CONTROL BOX ASSEMBLY,INDOOR	4995A20274A	4995A20274B	4995A20274C	R
263230-1	THERMISTOR ASSEMBLY(ROOM, PIPE-IN)	6323A20004M			R
263230-2	THERMISTOR ASSEMBLY(PIPE-OUT)	6323AQ3226Z			R
268712	PWB(PCB) ASSEMBLY,DISPLAY	6871A20227J			R
268715	PWB(PCB) ASSEMBLY,MAIN(AC)	6871A20274A			R
268716	PWB(PCB) ASSEMBLY,MAIN(DC)	6871A20275A	6871A20275B	6871A20275C	R
342800	BEARING	4280A20004A			R
35211B	TUBE ASSEMBLY,TUBING	5211A10324A			R
352150	HOSE ASSEMBLY,DRAIN	5251AR2575F			R
354210	EVAPORATOR ASSEMBLY,FIRST	5421A20086A			R
733010	PLATE	1H00843A			R
W0CZZ	CAPACITOR,DRAWING	3H01487A			R
346810	MOTOR ASSEMBLY,INDOOR	4681A20048L			R
267110	REMOTE CONTROLLER ASSEMBLY	6711A20010B			R
135314	GRILLE ASSEMBLY,INLET SUB	3531A10117U			R
352115	TUBE ASSEMBLY,EVAPORATOR IN	5211A10310A			R
352116	TUBE ASSEMBLY,EVAPORATOR OUT	5211A20911A			R
359011	FAN ASSEMBLY,CROSS FLOW	5901A20007A			R

Location No.	Description	Part No.	Remarks
		CRNN186STA0	
131410	CHASSIS ASSEMBLY	3141A10002A	R
135311	GRILLE ASSEMBLY,DISCHARGE(INDOOR)	3531A10231Y	R
135314	GRILLE ASSEMBLY,INLET SUB	3531A20107L	R
135312	GRILLE ASSEMBLY,FRONT(INDOOR)	3531A20207H	R
135516	COVER ASSEMBLY,MOTOR	3551A20099C	R
146811	MOTOR ASSEMBLY,STEP	4681A20055A	R
152302	FILTER(MECH),A/C	5230A20001A	R
159901-1	VANE,HORIZONTAL	5990A20008A	R
159901-2	VANE,HORIZONTAL	5990A20009A	R
249951	CONTROL BOX ASSEMBLY,INDOOR	4995A20274R	R
263230-1	THERMISTOR ASSEMBLY(ROOM, PIPE-IN)	6323A20004M	R
263230-2	THERMISTOR ASSEMBLY(PIPE-OUT)	6323AQ3226Z	R
267110	REMOTE CONTROLLER ASSEMBLY	6711A20010B	R
268712	PWB(PCB) ASSEMBLY,DISPLAY	6871A20227M	R
268715	PWB(PCB) ASSEMBLY,MAIN(AC)	6871A20274A	R
268716	PWB(PCB) ASSEMBLY,MAIN(DC)	6871A20275D	R
342800	BEARING	4280A20004A	R
346810	MOTOR ASSEMBLY,INDOOR	4681A20003D	R
352115	TUBE ASSEMBLY,EVAPORATOR IN	5211A14006A	R
352116	TUBE ASSEMBLY,EVAPORATOR OUT	5211A30057D	R
35211B	TUBE ASSEMBLY,TUBING	5211A10324B	R
352150	HOSE ASSEMBLY,DRAIN	5251AR2575F	R
359011	FAN ASSEMBLY,CROSS FLOW	5901A20008A	R
733010	PLATE ASSEMBLY,INSTALL	3301A10002A	R
W0CZZ	CAPACITOR,DRAWING	3H01487G	R
354210	EVAPORATOR ASSEMBLY,FIRST	5421A20010D	R

CRNN-SU
Art Cool Type(Mirror)

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1. Specifications

Model		Unit	CRNN076SU*0	CRNN096SU*0	CRNN126SU*0
Cooling Capacity		W	2,100	2,600	3,500
		kcal/h	1,806	2,235	3,009
		Btu/h	7,165	8,871	11,942
Heating Capacity		W	2,363	2,925	3,938
		kcal/h	2,031	2,515	3,385
		Btu/h	8,061	9,980	13,435
Dimensions (W*H*D)		mm	1,030*290*153	1,030*290*153	1,030*290*153
		inch	40.6*11.4*6.1	40.6*11.4*6.1	40.6*11.4*6.1
Coil	Rows x Columns x FPI		2*12*20	2*12*20	2*12*20
	Face Area	m^2	0.13	0.13	0.13
Moisture removal		*l*/h.	1.0	1.0	1.2
Fan	Type		Cross Flow Fan	Cross Flow Fan	Cross Flow Fan
	Motor Output x Number	W	7.5	7.5	14.4
	Air Flow Rate(High)	cmm	5.6	7.0	9.5
		cfm	196	247	336
	Drive		Direct		
	Speed control		Phase control		
Temperature Control			Microprocessor, Thermostat for cooling and heating		
Sound Absorbing Thermal Insulation Material			Foamed polystyrene		
Air Filter			Resin Net(Washable)		
Safety Device			Fuse	Fuse	Fuse
Pipe Connections	Liquid Side	mm(inch)	6.35 (1/4)	6.35 (1/4)	6.35 (1/4)
	Gas Side	mm(inch)	12.7 (1/2)	12.7 (1/2)	12.7 (1/2)
	Drain Pipe(Internal Dia.)	mm	25	25	25
Net Weight		kg(lbs)	8(18.5)	8(18.5)	9.5(20.9)
Noise Level (Sound Press,1m, H/M/L)		dBA±3	30/33/27	34/31/28	36/33/30
Power Supply		Ø,V,Hz	1,220~240,50	1,220~240,50	1,220~240,50
Power Cable		AWG#:P*mm^2	12:3*2.5	12:3*2.5	12:3*2.5
Refrigerant Control			L.E.V	L.E.V	L.E.V
Standard Accessories			Operation Manual, Installation Manual, Installation Panel, Paper Pattern for Installation, Clamps, Screws		
Frant Panel Color ("*"Position)			R: Mirror, G: Gold, B: Blue		

Notes:-

1. Capacities are based on the following conditions:
   - Cooling: - Indoor Temperature 27°C(80.6°F) DB /19°C(66.2°F) WB z
     - Outdoor Temperature 35°C(95°F) DB /24°C(75.2°F) WB
     - Interconnecting Piping Length 7.5m
     - Level Difference of Zero.
   - Heating: - Indoor Temperature 20°C(68°F) DB / 15°C(59°F) WB
     - Outdoor Temperature 7°C(44.6°F) DB / 6°C(42.8°F) WB
     - Interconnecting Piping Length 7.5 m
     - Level Difference of Zero.
2. Capacities are Net Capacities.
3. Due to our policy of innovation some specifications may be changed without notification.
4. L.E.V. : Linear Expansion Valve

Conversion Formula
kcal/h = kW x 860
Btu/h = kW x 3414
cfm = m^3/min x 35.3

2. Functions

Indoor Unit

Operation ON/OFF by Remote controller

Sensing the Room Temperature

- Room temperature sensor. (THERMISTOR)

Room temperature control

- Maintains the room temperature in accordance with the Setting Temp.

Starting Current Control

- Indoor fan is delayed for 5 sec at the starting.

Time Delay Safety Control

- Restarting is inhibited for approx. 3 minutes.

Indoor Fan Speed Control

- High, Med, Low, CHAOS, JET COOL

Soft Dry Operation Mode

- Intermittent operation of fan at low speed.

Sleep Mode Auto Control

- The fan is switched to low(Cooling), med(Heating) speed.
- The unit will be stopped after 1, 2, 3, 4, 5, 6, 7 hours.

Natural Air Control by CHAOS Logic

- The fan is switched to intermittent or irregular operation
- The fan speed is automatically switched from high to low speed.

Airflow Direction Control

- The louver can be set at the desired position or swing up and down automatically.

Defrost(Deice) control (Heating)

- Both the indoor and outdoor fan stops during defrosting.

Hot-start Control (Heating)

- The indoor fan does not rotate until the evaporator pipe temperature will be reached at 28°C.

3. Operation Details

1. MAIN UNIT FUNCTION

• DISPLAY

Operation Indicator

- ON while in appliance operation, OFF while in appliance pause.
- Flashing while in disconnection or short in Thermistor. (3 sec off / 0.5 sec on)

Sleep Timer Indicator

- ON while in sleep timer mode, OFF when sleep timer cancel or appliance operation pause.

Timer Indicator

- ON while in timer mode (on/off), OFF when timer mode is completed or canceled.

Defrost Indicator

- OFF except when hot start during heating mode operation or while in defrost control.

■ Cooling Mode Operation

- When the intake air temperature reaches 0.5°C below the setting temp, the compressor and the outdoor fan stop.
- When it reaches 0.5°C above the setting temp, they start to operate again.
  Compressor ON Temp ➲ Setting Temp+0.5°C
  Compressor OFF Temp ➲ Setting Temp-0.5°C
- While in compressor running, operating with the airflow speed set by the remote control. While in compressor not running, operating with the low airflow speed regardless of the setting.

■ Healthy Dehumidification Mode

- When the dehumidification operation input by the remote control is received, the intake air temperature is detected and the setting temp is automatically set according to the intake air temperature.
  26°C ≤ Intake Air Temp ➲ 25°C
  24°C ≤ Intake Intake Air Temp<26°C ➲ Intake Air Temp-1°C
  18°C ≤ Intake Intake Air Temp<24°C ➲ Intake Air Temp-0.5°C
  Intake Air Temp<18°C ➲ 18°C

- While in compressor off, the indoor fan repeats low airflow speed and pause.
- While the intake air temp is between compressor on temp. and compressor off temp., 10-min dehumidification operation and 4-min compressor off repeat.
  Compressor ON Temp. ➲ Setting Temp+0.5°C
  Compressor OFF Temp. ➲ Setting Temp-0.5°C
- In 10-min dehumidification operation, the indoor fan operates with the low airflow speed.

■ Heating Mode Operation

- When the intake air temp reaches +3°…above the setting temp, the compressor is turned off. When below the setting temp, the compressor is turned on.
  Compressor ON Temp. ➲ Setting Temp.
  Compressor OFF Temp. ➲ Setting Temp.+3°C
- While in compressor on, the indoor fan is off when the indoor pipe temp. is below 20°C, when above 28°C , it operates with the low or setting airflow speed. When the indoor pipe temp is between 20°C and 28°C, it operates with Super-Low(while in sleep mode, with the medium airflow speed).
- While in compressor off, the indoor fan is off when the indoor pipe temp is below 33°C, when above 35°C , it operates with the low airflow speed.
- If overloaded while in heating mode operation, in order to prevent the compressor from OLP operation, the outdoor fan is turned on/off according to the indoor pipe temp.
- While in defrost control, both of the indoor and outdoor fans are turned off.

■ Defrost Control

- While in heating mode operation in order to protect the evaporator pipe of the outdoor unit from freezing, reversed to cooling cycle to defrost the evaporator pipe of the outdoor unit.
- After 40 min heating mode operation, at 4 min interval, whether to carry out defrost control or not and the time of defrost control are determined according to the following conditions.

1) While in heating mode operation, the maximum of the indoor pipe temperature is measured and it is compared with the present indoor pipe temperature to get the difference of the indoor pipe temperatures (=the maximum temperature of indoor pipe ? the present temperature of indoor pipe), according to which, whether to carry out defrost control or not is determined.
2) According to the need of defrost control shown above and the elapsed time of heating mode operation at that moment, the defrost control time is determined.
3) When the determined time of defrost control is below 7 min, heating mode operation continues without carrying out defrost control. According to the procedure stated above, the determination is made again. When the defrost control time is 7 min or longer, defrost control is then carried out.

- While in defrost control, the minimum temp of the indoor pipe is measured and it is compared with the present temp of the indoor pipe to get the difference of the indoor pipe temperatures (=the present temperature of the indoor pipe ? the minimum temperature of the indoor pipe). When the difference is 5°C or higher, defrost control is completed and heating mode operation is carried out.
- While in defrost control, if the defrost time determined before the start of defrost control is completed, defrost control stops and heating mode operation is carried out regardless of the above condition.
- When the indoor pipe temp is 42°C or above, defrost control is not carried out even if the condition is one of the defrost conditions above.
- While in defrost control, the compressor is on and the indoor fan, the outdoor fan, and the 4 way valve are off.

■ Fuzzy Operation

- When any of operation mode is not selected like the moment of the power on or when 3 hrs has passed since the operation off, the operation mode is selected.
- When determining the operation mode, the compressor, the outdoor fan, and the 4 way valve are off and only the indoor fan is operated for 15 seconds. Then an operation mode is selected according to the intake air temp at that moment as follows.

  24°C ≤ Inatake Air Temp ➲ Fuzzy Operation for Cooling
  21°C ≤ Inatake Air Temp<24°C ➲ Fuzzy Operation for Dehumidification
  Inatake Air Temp<21°C ➲ Fuzzy Operation for Heating
- If any of the operation modes among cooling / dehumidification / heating mode operations is carried out for 10 sec or longer before Fuzzy operation, the mode before Fuzzy operation is operated.

1) Fuzzy Operation for Cooling

- According to the setting temperature selected by Fuzzy rule, when the intake air temp is 0.5°C or more below the setting temp, the compressor is turned off. When 0.5°C or more above the setting temp, the compressor is turned on.

  Compressor ON Temp ➲ Setting Temp +0.5°C
  Compressor OFF Temp ➲ Setting Temp + 0.5°C
- At the beginning of Fuzzy mode operation, the setting temperature is automatically selected according to the intake air temp at that time.

  26°C≤ Intake Air Temp ➲ 25°C
  24°C≤ Intake Air Temp<26°C ➲ Intake Air Temp + 1°C
  22°C≤ Intake Air Temp<24°C ➲ Intake Air Temp + 0.5°C
  18°C≤ Intake Air Temp<22°C ➲ Intake Air Temp
  Intake Air Temp<18°C ➲ 18°C
- When the Fuzzy key (Temperature Control key) is input after the initial setting temperature is selected, the Fuzzy key value and the intake air temperature at that time are compared to select the setting temperature automatically according to the Fuzzy rule.
- While in Fuzzy operation, the airflow speed of the indoor fan is automatically selected according to the temperature.

2) Fuzzy Operation for Dehumidification

- According to the setting temperature selected by Fuzzy rule, when the intake air temp is 0.5°C or more below the setting temp, the compressor is turned off. When 0.5°C or more above the setting temp, the compressor is turned on.

  Compressor ON Temp ➲ Setting Temp + 0.5°C
  Compressor OFF Temp ➲ Setting Temp+0.5°C
- At the beginning of Fuzzy mode operation, the setting temperature is automatically selected according to the intake air temp at that time.

  26°C ≤ Intake Air Temp ➲ 25°C
  24°C ≤ Intake Air Temp<26°C ➲ Intake Air Temp+1°C
  22°C ≤ Intake Air Temp<24°C ➲ Intake Air Temp+0.5°C
  18°C ≤ Intake Air Temp<22°C ➲ Intake Air Temp
  Intake Air Temp<18°C ➲ 18°C
- When the Fuzzy key (Temperature Control key) is input after the initial setting temperature is selected, the Fuzzy key value and the intake air temperature at that time are compared to select the setting temperature automatically according to the Fuzzy rule.
- While in Fuzzy operation, the airflow speed of the indoor fan repeats the low airflow speed or pause as in dehumidification operation.

3) Fuzzy Operation for Heating

- According to the setting temperature selected by Fuzzy rule, when the intake air temp is 3°C or more above the setting temp, the compressor is turned off. When below the setting temp, the compressor is turned on.
  Compressor ON Temp ➲ Setting Temp
  Compressor OFF Temp ➲ Setting Temp + 3°C
- At the beginning of Fuzzy mode operation, the setting temperature is automatically selected according to the intake air temp at that time.
  20°C≤Intake Air Temp ➲ Intake Air Temp + 0.5°C
  Intake Air Temp<20°C ➲ 20°C
- When the Fuzzy key (Temperature Control key) is input after the initial setting temperature is selected, the Fuzzy key value and the intake air temperature at that time are compared to select the setting temperature automatically according to the Fuzzy rule.
- While in Fuzzy operation, the airflow speed of the indoor fan is set to the high or the medium according to the intake air temperature and the setting temperature.

■ Airflow Speed Selection

- The airflow speed of the indoor fan is set to high, medium, low, or chaos (auto) by the input of the airflow speed selection key on the remote control.

■ On-Timer Operation

- When the set time is reached after the time is input by the remote control, the appliance starts to operate.
- The timer LED is on when the on-timer is input. It is off when the time set by the timer is reached.
- If the appliance is operating at the time set by the timer, the operation continues.

■ Off-Timer Operation

- When the set time is reached after the time is input by the remote control, the appliance stops operating.
- The timer LED is on when the off-timer is input. It is off when the time set by the timer is reached.
- If the appliance is on pause at the time set by the timer, the pause continues.

■ Off-Timer ↔ On-Timer Operation

- When the set time is reached after the on/off time is input by the remote control, the on/off-timer operation is carried out according to the set time.

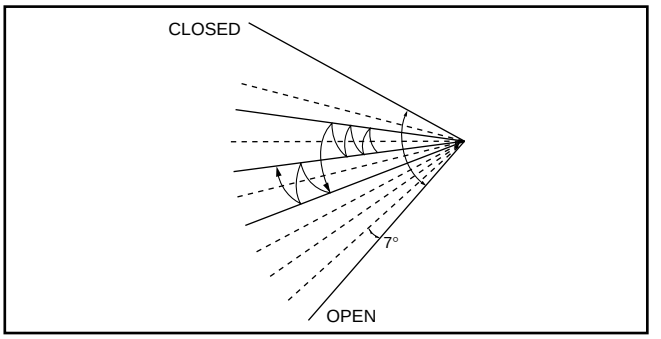
■ Sleep Timer Operation

- When the sleep time is reached after <1,2,3,4,5,6,7,0(cancel) hr> is input by the remote control while in appliance operation, the operation of the appliance stops.
- While the appliance is on pause, the sleep timer mode cannot be input.
- While in cooling mode operation, 30 min later since the start of the sleep timer, the setting temperature increases by 1°C. After another 30 min elapse, it increases by 1°C again.
- When the sleep timer mode is input while in cooling cycle mode, the airflow speed of the indoor fan is set to the low.
- When the sleep timer mode is input while in heating cycle mode, the airflow speed of the indoor fan is set to the medium.

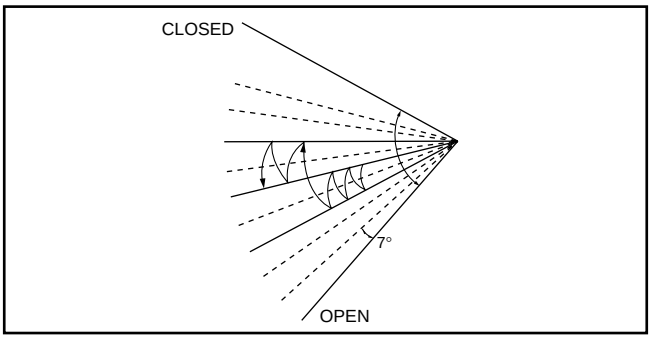
■ Chaos Swing Mode

- By the Chaos Swing key input, the upper/lower vane automatically operates with the Chaos Swing or they are fixed to the desired direction.
- While in Chaos Swing mode, the angles of cooling and heating cycle operations are different.

< Cooling Mode >



< Heating Mode >



■ Chaos Natural Wind Mode

- When the Chaos Natural Wind mode is selected and then operated, the high, medium, or low speed of the airflow mode is operated for 2~15 sec. randomly by the Chaos Simulation.

■ Jet Cool Mode Operation

- While in heating mode or Fuzzy operation, the Jet Cool key cannot be input. When it is input while in the other mode operation (cooling, dehumidification, ventilation), the Jet Cool mode is operated.
- In the Jet Cool mode, the indoor fan is operated at super-high speed for 30 min at cooling mode operation.
- In the Jet Cool mode operation, the room temperature is controlled to the setting temperature, 18°C.
- When the sleep timer mode is input while in the Jet Cool mode operation, the Jet Cool mode has the priority.
- When the Jet Cool key is input, the upper/lower vanes are reset to those of the initial cooling mode and then operated in order that the air outflow could reach further.

■ Forced Operation

- Operation procedures when the remote control can't be used.
- The operation will be started if the power button is pressed.
- If you want to stop operation, re-press the button.

	Room temperature ≥ 24°C	**21°C ≤ Room temperature < 24°C**	**Room temperature < 21°C**
Operating mode	Cooling	Healthy Dehumidification	Heating
Indoor FAN Speed	High	High	High
Setting Temperature	22°C	23°C	24°C

- While in forced operation, the key input by the remote control has no effect and the buzzer sounds 10 times to indicate the forced operation.

■ Test operation

- During the TEST OPERATION, the unit operates in cooling mode at high speed fan, regardless of room temperature and resets in 18±1 minutes.
- During test operation, if remote controller signal is received, the unit operates as remote controller sets. If you want to use this operation, open the front panel upward and Press the power button let it be pressed for about 3 seconds.
- If you want to stop the operation, re-press the button.

■ Auto restart

- In case the power comes on again after a power failure, Auto Restarting Operation is the function to operate procedures automatically to the previous operating conditions.

■ Air Cleaner Operation

- When an air cleaner function is selected during Air Conditioner operation
  - Plasma air cleaner function will be operated while in any operation mode with selecting the function.
  - The function is to be stopped while it is operating with selecting the function.
- When an air cleaner function is selected during operation off
  - The function will be only operated.
- When inlet grille of air conditioner is opened during plasma operation, High Voltage Generator(H.V.B) is to be stopped. When inlet grille of air conditioner is closed during plasma operation, High Voltage Generator(H.V.B) will be operated again.

■ Remote Control Operation Mode

- When the remote control is selected by the slide switch on the main unit, the appliance operates according to the input by the remote control.

■ Protection of the evaporator pipe from frosting

- If the indoor pipe temp is below 0°C in 7 min. after the compressor operates without any pause while in cooling cycle operation mode, the compressor and the outdoor fan are turned off in order to protect the indoor evaporator pipe from frosting.
- When the indoor pipe temp is 7°C or higher after 3 min. pause of the compressor, the compressor and the outdoor fan is turned on according to the condition of the room temperature.

■ Auto Clean

- Open the door on the remote control. Press the Auto Clean Button.
  Close the door on the remote control. Now each time that you press the start/stop button, the Air conditioner operates clean function automatically.

■ Display Luminosity

- The Display Luminosity can be adjusted by using the remote control.
  Press the start/stop button to start the unit. Open the door on the remote control, press the 2ndF button and, press display luminosity button. Display will be dark. Press the button again to set bright display.

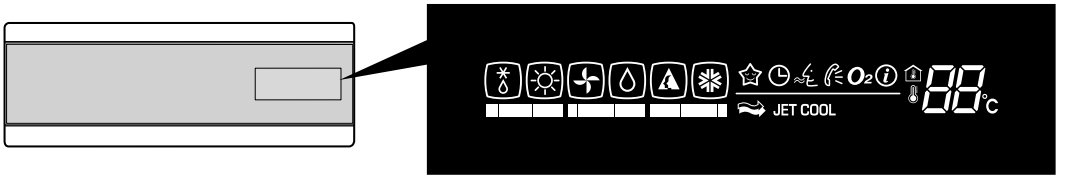
■ Buzzer Sounding Operation

- When the appliance-operation key is input by the remote control, the short "beep" sounds.
- When the appliance-pause key is input by the remote control, the long "beep—" sounds.
- When an except operation and pause key is input by the remote control, the short "beep" sounds.

4. Display Function

Signal Receptor

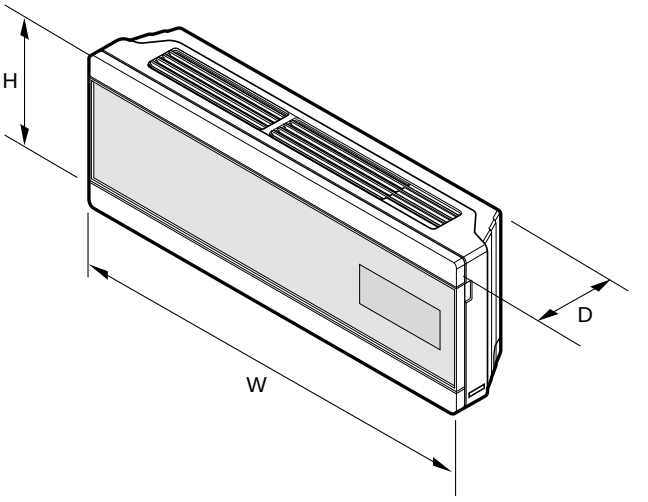
Each Icon turns on when the unit is operated, then the only Icon outline to be operated is bright.



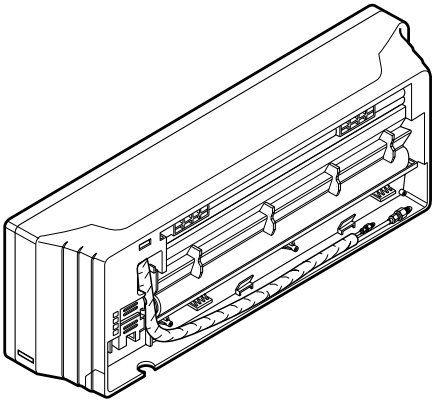
	Cooling Mode	Lights up during Cooling operation. (Outline)
	Auto Operation Mode	Lights up during Auto operation. (Outline)
	Healthy Dehumidification Mode	Lights up during Healthy Dehumidification operation. (Outline)
	Heating Mode	Lights up during Heating operation. (Heat Pump model only) (Outline)
	Defrost Mode	Lights up during Defrost control or Hot Start in Heating operation. (Outline)
	Air circulation Mode	Lights up during Air Circulation operation. (Outline)
	Sleep Mode	Lights up during Sleep Mode operation.
	Timer Mode	Lights up during Timer operation.
	Auto Cleaning Mode	Lights up during Auto Cleaning reservation.
JET COOL	**Jet Cool Mode**	Lights up during Jet Cool Operation.
	Fan Speed (Low)	Lights up when Fan speed is low.
	Fan Speed (Medium)	Lights up when Fan speed is Medium.
	Fan Speed (High)	Lights up when Fan speed is High.
	Fan Speed (Chaos)	Lights up when Fan speed is Chaos.
88℃	**Desire temperature indicator**	For cooling,dehumidification,heating modes it display Desired temperature • Cooling : 18~30°C • Dehumidification : 18~30°C • Heating : 16~30°C • AI : Auto Operation • Po : Jet Cool • Lo : Test Mode • C1 : Indoor pipe sensor error
	Desire temperature Icon	
	Indoor temperature Icon	

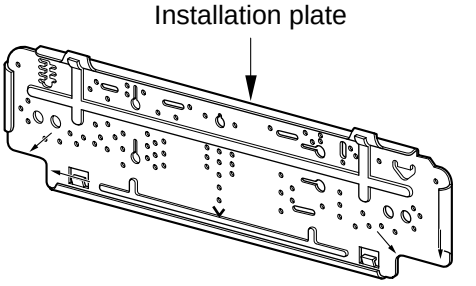
5. Dimensional Drawings

CRNN076SU*0
CRNN096SU*0
CRNN126SU*0



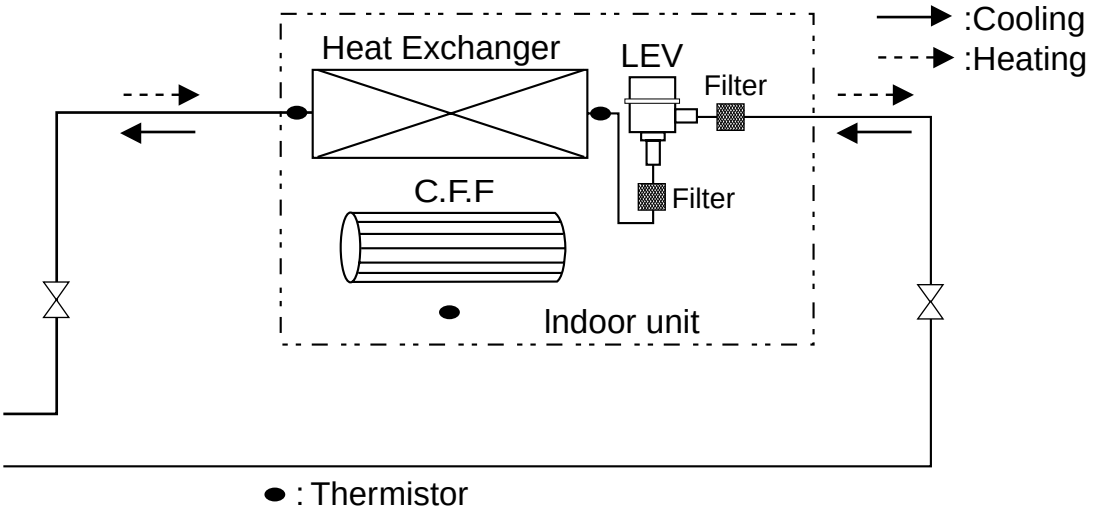
(unit: mm)





Model No.	W	H	D
CRNN076SU*0	1030	290	153
CRNN096SU*0			
CRNN126SU*0			

6. Piping Diagrams

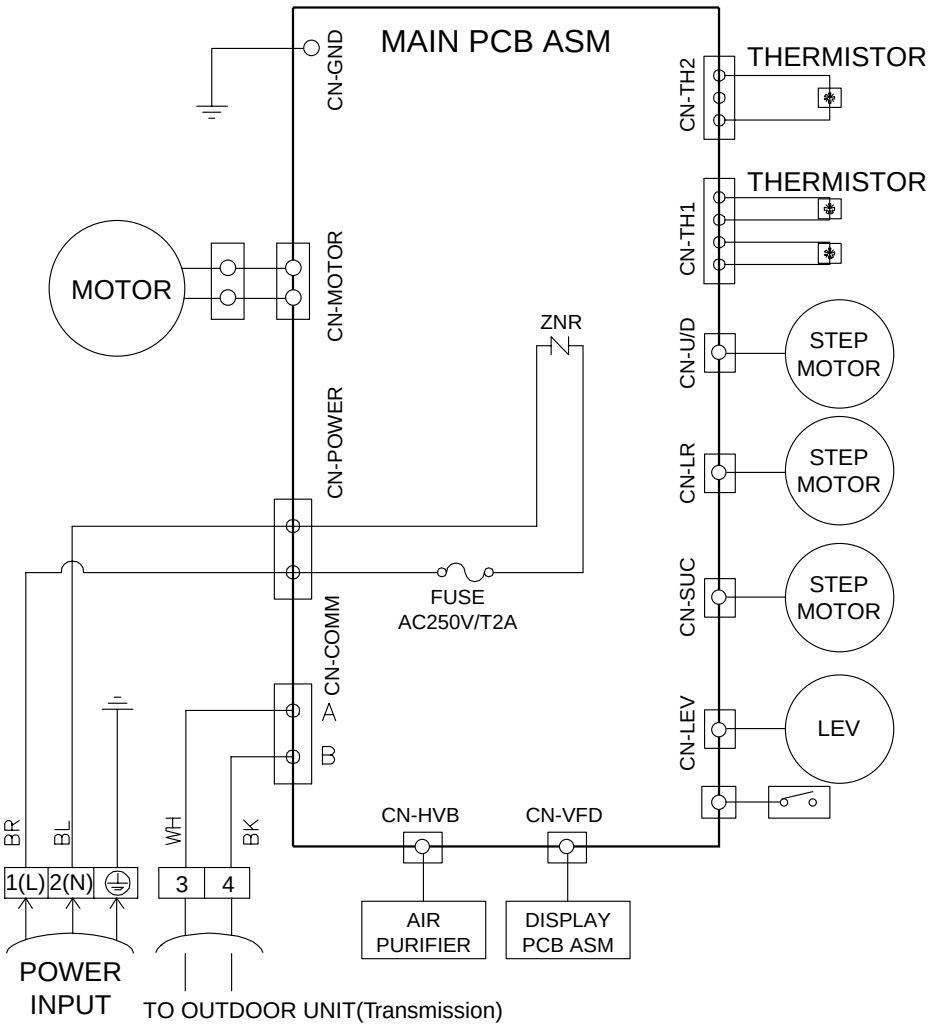


Refrigerant pipe connection port diameter

[unit: mm(inch)]

Model	Gas	Liquid
CRNN076SU*0	12.7(1/2)	6.35(1/4)
CRNN096SU*0		
CRNN126SU*0		

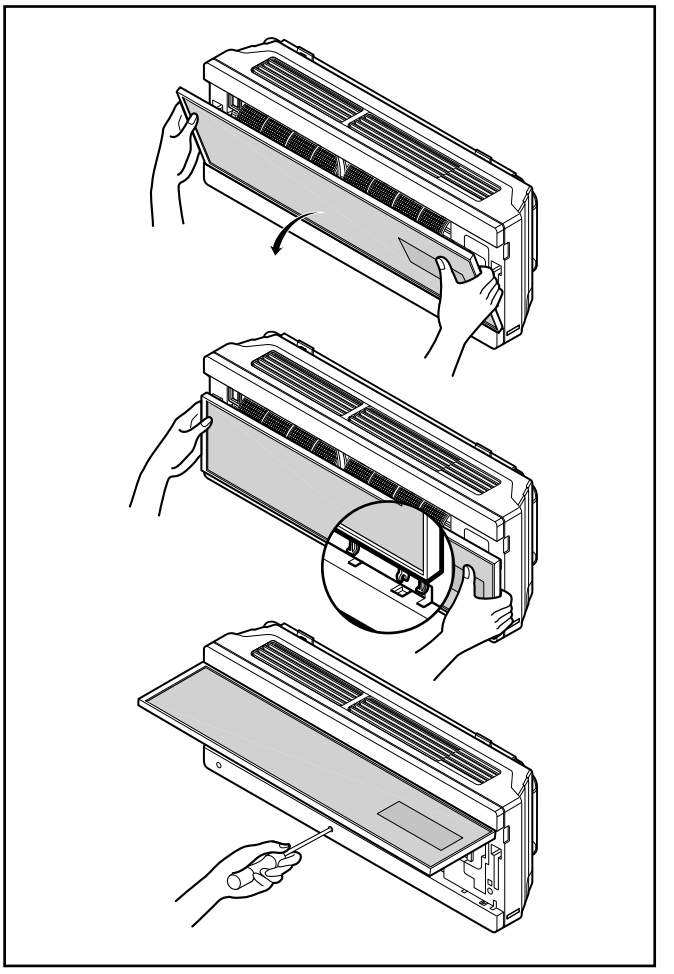
7. Wiring Diagrams



CONNECTOR NUMBER	SPEC	COLOR	DESCRIPTION
CN-POWER	AC POWER SUPPLY	WHITE	AC POWER LINE INPUT FOR INDOOR CONTROLLER
CN-MOTOR2	BLDC FAN MOTOR OUTPUT	WHITE	MOTOR OUTPUT OF BLDC
CN-COM	COMMUNICATION	WHITE	COMMUNICATION BETWEEN INDOOR AND OUTDOOR
CN-LEV	LEV OUTPUT	WHITE	LEV CONTROL OUTPUT
CN-DISP1	DISPLAY	BLUE	DISPLAY OF INDOOR STATUS
CN-DISP2	DISPLAY	WHITE	DISPLAY OF INDOOR STATUS
CN-LEV	LEV OUTPUT	WHITE	LEV CONTROL OUTPUT
CN-LR1	STEP MOTOR	WHITE	STEP MOTOR OUTPUT FOR LEFT/RIGHT
CN-LR2	STEP MOTOR	WHITE	STEP MOTOR OUTPUT FOR LEFT/RIGHT
CN-UD	STEP MOTOR	BLUE	STEP MOTOR OUTPUT
CN-TH1	ROOM/PIPE SENSOR	WHITE	ROOM & PIPE THERMISTOR
CN-TH2	DISCHARGE PIPE SENSOR	RED	DISCHARGE PIPE THERMISTOR

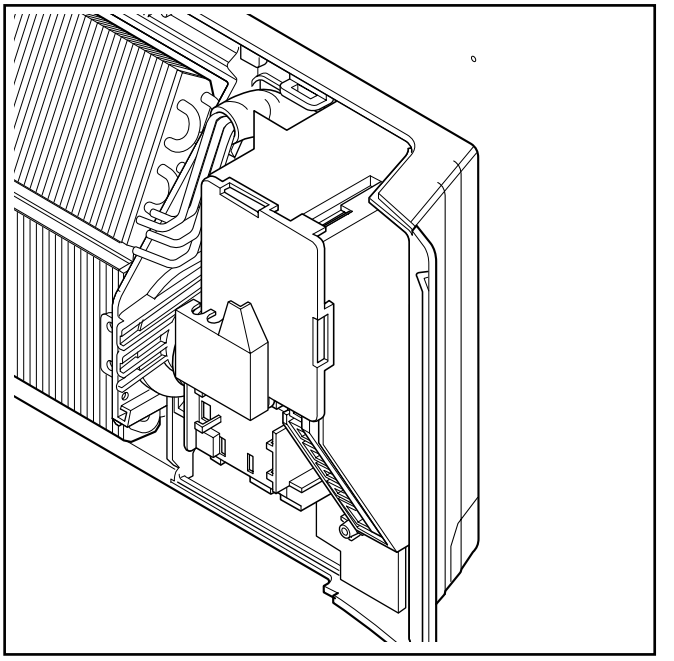
8. Disassembly of the parts

Warning :
Disconnect the unit from power supply before making any checks.
Be sure the power switch is set to “OFF”.



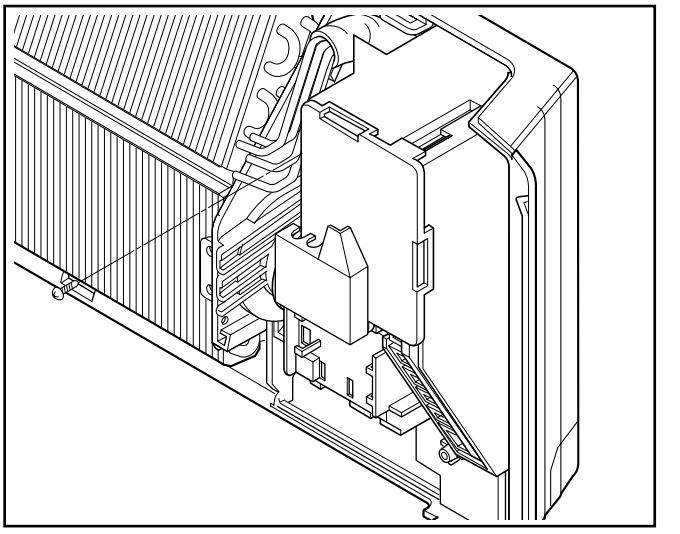
To remove the Grille from the Chassis.
- Hold up Inlet Grille Horizentally.
- To remove the Grille, pull the lower left and right side of the grille toward you (slightly tilted) and lift it straight upward.
- To seperate connecter assembly and than to remove Inlet Grille assembly.

1. Before removing the control box, be sure to take out the wire screwed at the other end.



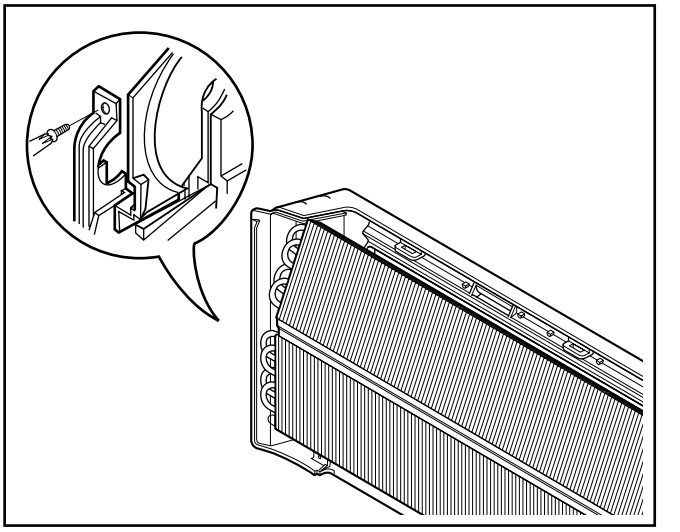
2. To remove the Control Box.

- Remove securing screws.
- Pull the control box out from the chassis carefully.



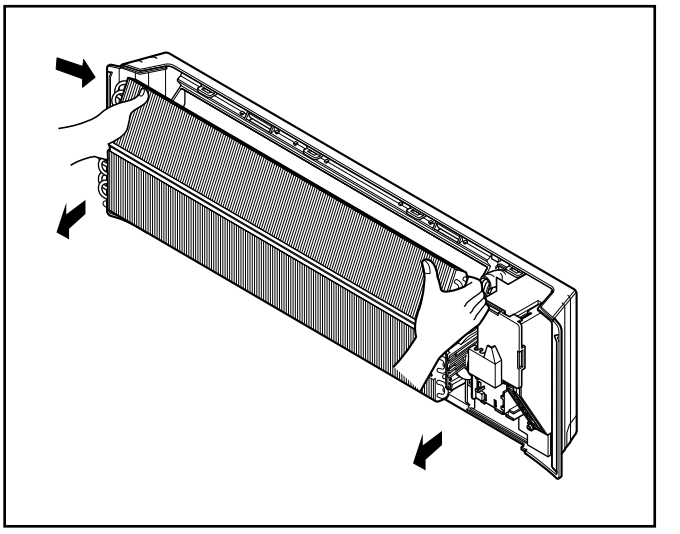
3. To remove the Discharge Grille.

- Unhook the discharge grille and pull the discharge grille out from the chassis carefully.

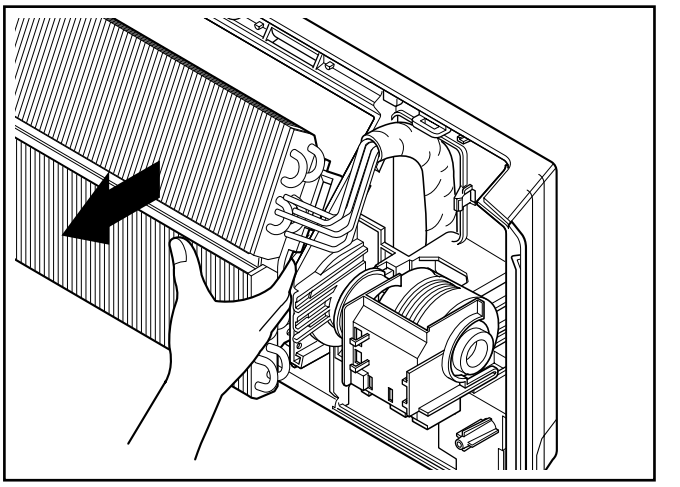


4. To remove the Evaporator.

- Remove 3 screws securing the evaporator(at the left 2EA in the Eva Holder, at the right 1EA).

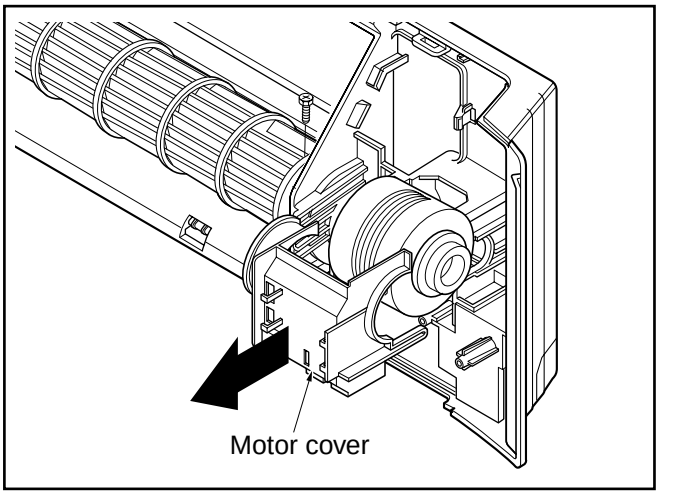


- Unhook the tab on the right inside of the chassis at the same time, slightly pull the evaporator toward you until the tab is clear of the slot.



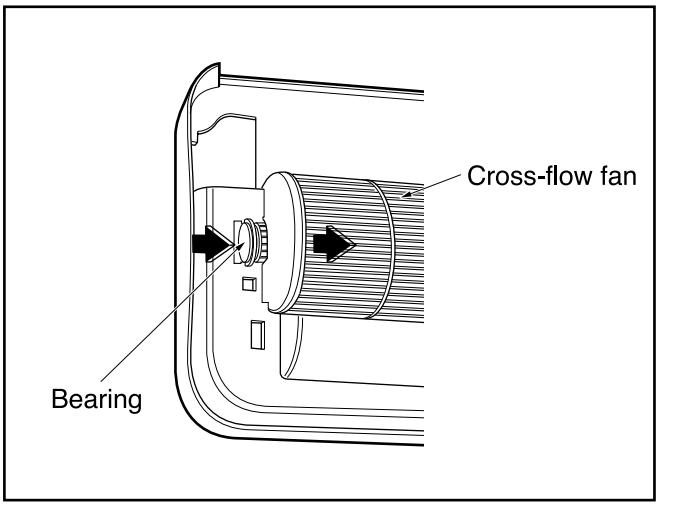
5. To remove the Motor Cover

- Remove 2 securing screw.
- Pull the motor cover out from the chassis carefully.



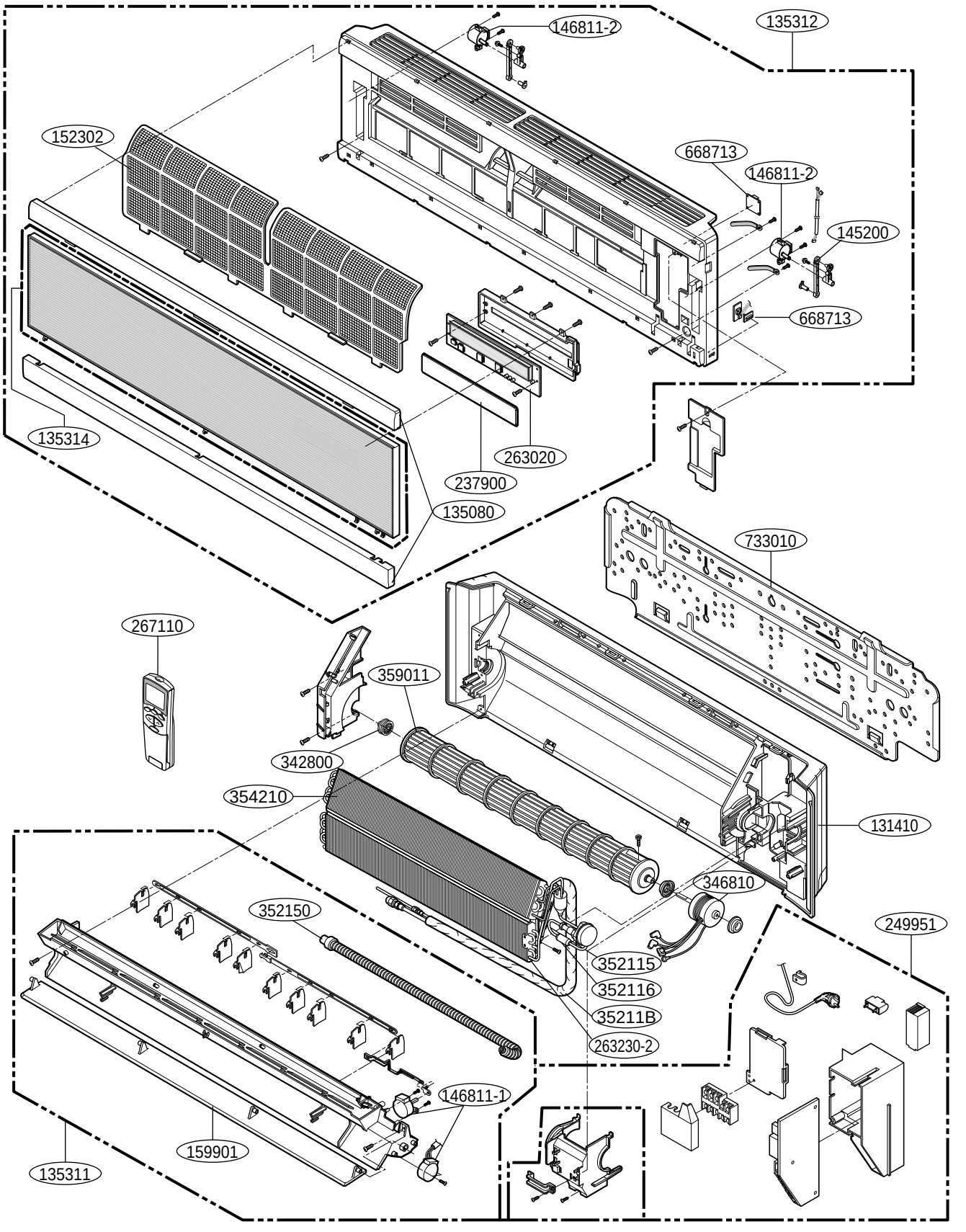
6. To remove the Cross-Flow Fan

- Loosen the screw securing the cross-flow fan to the fan motor (do not remove).
- Lift up the right side of the cross-flow fan and the fan motor, separate the fan motor from the cross-flow fan.



- Remove the left end of the cross-flow fan from the self-aligning bearing.

9. Exploded View



10. Replacement Parts List

LOCATION No.	DESCRIPTION		PART No.			REMARKS
			CRNN076SU*0	CRNN096SU*O	CRNN126SU*0	
131410	CHASSIS ASSEMBLY		3141A20007B			R
135080	DECORATION(TOP)		3508A20034A			R
135080	DECORATION(BOTTOM)		3508A20034B			R
135311	GRILLE ASSEMBLY,DISCHARGE		3531A10137B			R
135314	GRILLE ASSEMBLY,INLET	MIRROR				R
		BLUE				R
		GOLD				R
135312	GRILLE ASSEMBLY,FRONT	MIRROR				R
		BLUE				R
		GOLD				R
145200	LINK		4520A20008A			R
146811-1	MOTOR ASSEMBLY,STEP		4681A20055A			R
146811-2	MOTOR ASSEMBLY,STEP		4681A20055B			R
152302	FILTER (MECH),A/C		5230A20022A			R
159901	VANE HORIZONTAL		5990A20015B			R
237900	WINDOW,DISPLAY		3790A20037F			R
249951	CONTROL BOX ASSEMBLY					R
263020	DIGITRON		6302A90003A			R
263230-1	THERMISTOR ASSEMBLY(ROOM, PIPE-IN)					R
263230-2	THERMISTOR ASSEMBLY(PIPE-OUT)					R
267110	REMOTE CONTROLLER ASSEMBLY					R
268714	PWB(PCB) ASSEMBLY,MAIN					R
342800	BEARING		4280A20004A			R
346810	MOTOR ASSEMBLY,INDOOR					R
352115	TUBE ASSEMBLY,EVAPORATOR IN					R
352116	TUBE ASSEMBLY,EVAPORATOR OUT					R
35211B	TUBE ASSEMBLY,TUBING		5211AR7066N			R
352150	HOSE ASSEMBLY,DRAIN		5251AR1222R			R
354210	EVAPORATOR ASSEMBLY,FIRST					R
359011	FAN ASSEMBLY,CROSS FLOW		5901A20016A			R
668713	PWB ASSEMBLY,SUB					R
668713	PWB ASSEMBLY,SUB					R
733010	PLATE		1H00843A			R
W0CZZ	CAPACITOR,DRAWING		3H01487A			R

CRNN-SP
Art Cool Type

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1. Specifications

Model		Unit	CRNN096SP*0	CRNN126SP*0
Cooling Capacity		W	2,600	3,500
		kcal/h	2,235	3,009
		Btu/h	8,871	11,942
Heating Capacity		W	2,925	3,938
		kcal/h	2,515	3,385
		Btu/h	9,980	13,435
Dimensions (W*H*D)		mm	570*570*137	570*570*137
		inch	22.4*22.4*5.4	22.4*22.4*5.4
Coil	Rows x Columns x FPI		2*20*20	2*20*20
	Face Area	m^2	0.17	0.17
Moisture removal		*l*/h.	1.3	1.5
Fan	Type		Turbo Fan	Turbo Fan
	Motor Output x Number	W	24*1	24*1
	Air Flow Rate(High)	cmm	7.0	8.7
		cfm	247	307
	Drive		Direct	Direct
	Speed control		BLDC	BLDC
Temperature Control			Microprocessor, Thermostat for cooling and heating	
Sound Absorbing Thermal Insulation Material			Foamed polystyrene	Foamed polystyrene
Air Filter			Accessory	Accessory
Safety Device			Fuse	Fuse
Pipe Connections	Liquid Side	mm(inch)	6.35 (1/4)	6.35 (1/4)
	Gas Side	mm(inch)	12.7 (1/2)	12.7 (1/2)
	Drain Pipe(Internal Dia.)	mm	12.2	12.2
Net Weight		kg(lbs)	12(26.5)	12(26.5)
Noise Level (Sound Press,1m, H/M/L)		dBA±3	36 / 33 / 30	40 / 36 / 31
Power Supply		Ø,V,Hz	1,220~240,50	1,220~240,50
Power Cable		AWG#:P*mm^2	12:3*2.5	12:3*2.5
Refrigerant Control			L.E.V	L.E.V
Standard Accessories			Operation Manual, Installation Manual, Installation guide map, Clamps, Screws	
Front Panel Color ('*' position)			M: Metal, D:Wood, B: Blue	

Notes:-

1. Capacities are based on the following conditions:
   - Cooling: - Indoor Temperature 27°C(80.6°F) DB /19°C(66.2°F) WB
     - Outdoor Temperature 35°C(95°F) DB /24°C(75.2°F) WB
     - Interconnecting Piping Length 7.5m
     - Level Difference of Zero.
   - Heating: - Indoor Temperature 20°C(68°F) DB / 15°C(59°F) WB
     - Outdoor Temperature 7°C(44.6°F) DB / 6°C(42.8°F) WB
     - Interconnecting Piping Length 7.5 m
     - Level Difference of Zero.
2. Capacities are Net Capacities.
3. Due to our policy of innovation some specifications may be changed without notification.
4. L.E.V. : Linear Expansion Valve

Conversion Formula
kcal/h = kW x 860
Btu/h = kW x 3414
cfm = m^3/min x 35.3

2. Functions

Indoor Unit

Operation ON/OFF by Remote controller

Sensing the Room Temperature

• Room temperature sensor. (THERMISTOR)

Room temperature control

• Maintains the room temperature in accordance with the Setting temperature

Starting Current Control

• Indoor fan is delayed for 5 sec at the starting.

Time Delay Safety Control

• Restarting is inhibited for approx. 3 minutes.

Indoor Fan Speed Control

• High, Med, Low, CHAOS

Operation indication Lamps (LED)

Signal Receptor
Receives the signals from the remote control.(Signal receiving sound: two short beeps or one long beep.)
Operation Indication Lamps

⏻	On/Off	: Lights up during the system operation.
☆	Sleep Mode	: Lights up during Sleep Mode Auto operation.
🕒	Timer	: Lights up during Timer operation.
✳	Defrost Mode	: Lights up during Defrost Mode or Hot Start operation.
88	Temperature	: Indicate the setting temperature.

Soft Dry Operation Mode

• Intermittent operation of fan at low speed.

Sleep Mode Auto Control

• The fan is switched to low(Cooling), med(Heating) speed.
• The unit will be stopped after 1, 2, 3, 4, 5, 6, 7 hours.

Natural Air Control by CHAOS Logic

• The fan is switched to intermittent or irregular operation
• The fan speed is automatically switched from high to low speed.

Airflow Direction Control

• The louver can be set at the desired position or swing up and down automatically.

Defrost(Deice) control (Heating)

• Both the indoor and outdoor fan stops during defrosting.

Hot-start Control (Heating)

• The indoor fan does not rotate until the evaporator pipe temperature will be reached at 28°C.

3. Operation Details

(1) MAIN UNIT FUNCTION

• DISPLAY

Operation Indicator

- ON while in appliance operation, OFF while in appliance pause.
- Flashing while in disconnection or short in Thermistor. (3 sec off / 0.5 sec on)

Sleep Timer Indicator

- ON while in sleep timer mode, OFF when sleep timer cancel or appliance operation pause.

Timer Indicator

- ON while in timer mode (on/off), OFF when timer mode is completed or canceled.

Defrost Indicator

- OFF except when hot start during heating mode operation or while in defrost control.

■ Cooling Mode Operation

- When the intake air temperature reaches 0.5°C below the setting temperature, the compressor and the outdoor fan stop.
- When it reaches 0.5°C above the setting temperature, they start to operate again.
  Compressor ON Temperature ➲ Setting Temperature +0.5°C
  Compressor OFF Temperature ➲ Setting Temperature -0.5°C
- While in compressor running, operating with the airflow speed set by the remote control. While in compressor not running, operating with the low airflow speed regardless of the setting.

■ Healthy Dehumidification Mode

- When the dehumidification operation input by the remote control is received, the intake air temperature is detected and the setting temperature is automatically set according to the intake air temperature.
  26°C ≤ Intake Air Temperature ➲ 25°C
  24°C ≤ Intake Intake Air Temperature <26°C ➲ Intake Air Temperature -1°C
  18°C ≤ Intake Intake Air Temperature <24°C ➲ Intake Air Temperature -0.5°C
  Intake Air Temperature <18°C ➲ 18°C

- While in compressor off, the indoor fan repeats low airflow speed and pause.
- While the intake air temperature is between compressor on temperature and compressor off temperature, 10-min dehumidification operation and 4-min compressor off repeat.
  Compressor ON temperature ➲ Setting Temperature +0.5°C
  Compressor OFF temperature ➲ Setting Temperature -0.5°C
- In 10-min dehumidification operation, the indoor fan operates with the low airflow speed.

■ Heating Mode Operation

- When the intake air temperature reaches +3°C above the setting temperature, the compressor is turned off. When below the setting temperature, the compressor is turned on.
  Compressor ON temperature ➲ Setting temperature
  Compressor OFF temperature ➲ Setting temperature+3°C
- While in compressor on, the indoor fan is off when the indoor pipe temperature is below 20°C, when above 28°C, it operates with the low or setting airflow speed. When the indoor pipe temperature is between 20°C and 28°C, it operates with Super-Low(while in sleep mode, with the medium airflow speed).
- While in compressor off, the indoor fan is off when the indoor pipe temperature is below 33°C, when above 35°C , it operates with the low airflow speed.
- If overloaded while in heating mode operation, in order to prevent the compressor from OLP operation, the outdoor fan is turned on/off according to the indoor pipe temperature
- While in defrost control, both of the indoor and outdoor fans are turned off.

■ Fuzzy Operation

- When any of operation mode is not selected like the moment of the power on or when 3 hrs has passed since the operation off, the operation mode is selected.
- When determining the operation mode, the compressor, the outdoor fan, and the 4 way valve are off and only the indoor fan is operated for 15 seconds. Then an operation mode is selected according to the intake air temperature at that moment as follows.
  24°C ≤ Inatake Air Temperature ➲ Fuzzy Operation for Cooling
  21°C ≤ Inatake Air Temperature <24°C ➲ Fuzzy Operation for Dehumidification
  Inatake Air Temperature <21°C ➲ Fuzzy Operation for Heating
- If any of the operation modes among cooling / dehumidification / heating mode operations is carried out for 10 sec or longer before Fuzzy operation, the mode before Fuzzy operation is operated.

1) Fuzzy Operation for Cooling

- According to the setting temperature selected by Fuzzy rule, when the intake air temperature is 0.5°C or more below the setting temperature, the compressor is turned off. When 0.5°C or more above the setting temperature, the compressor is turned on.
  Compressor ON Temperature ➲ Setting Temperature +0.5°C
  Compressor OFF Temperature ➲ Setting Temperature + 0.5°C
- At the beginning of Fuzzy mode operation, the setting temperature is automatically selected according to the intake air temperature at that time.
  26°C≤ Intake Air Temperature ➲ 25°C
  24°C≤ Intake Air Temperature <26°C ➲ Intake Air Temperature + 1°C
  22°C≤ Intake Air Temperature <24°C ➲ Intake Air Temperature + 0.5°C
  18°C≤ Intake Air Temperature <22°C ➲ Intake Air Temperature
  Intake Air Temperature <18°C ➲ 18°C
- When the Fuzzy key (Temperature Control key) is input after the initial setting temperature is selected, the Fuzzy key value and the intake air temperature at that time are compared to select the setting temperature automatically according to the Fuzzy rule.
- While in Fuzzy operation, the airflow speed of the indoor fan is automatically selected according to the temperature.

2) Fuzzy Operation for Dehumidification

- According to the setting temperature selected by Fuzzy rule, when the intake air temperature is 0.5°C or more below the setting temperature, the compressor is turned off. When 0.5°C or more above the setting temperature, the compressor is turned on.
  Compressor ON Temperature ➲ Setting Temperature + 0.5°C
  Compressor OFF Temperature ➲ Setting Temperature +0.5°C
- At the beginning of Fuzzy mode operation, the setting temperature is automatically selected according to the intake air temperature at that time.
  26°C ≤ Intake Air Temperature ➲ 25°C
  24°C ≤ Intake Air Temperature <26°C ➲ Intake Air Temperature +1°C
  22°C ≤ Intake Air Temperature <24°C ➲ Intake Air Temperature +0.5°C
  18°C ≤ Intake Air Temperature <22°C ➲ Intake Air Temperature
  Intake Air Temperature <18°C ➲ 18°C
- When the Fuzzy key (Temperature Control key) is input after the initial setting temperature is selected, the Fuzzy key value and the intake air temperature at that time are compared to select the setting temperature automatically according to the Fuzzy rule.
- While in Fuzzy operation, the airflow speed of the indoor fan repeats the low airflow speed or pause as in dehumidification operation.

3) Fuzzy Operation for Heating

- According to the setting temperature selected by Fuzzy rule, when the intake air temperature is 3°C or more above the setting temperature, the compressor is turned off. When below the setting temperature, the compressor is turned on.
  Compressor ON Temperature ➲ Setting Temperature
  Compressor OFF Temperature ➲ Setting Temperature + 3°C
- At the beginning of Fuzzy mode operation, the setting temperature is automatically selected according to the intake air temperature at that time.
  20°C≤Intake Air Temperature ➲ Intake Air Temperature + 0.5°C
  Intake Air Temperature <20°C ➲ 20°C
- When the Fuzzy key (Temperature Control key) is input after the initial setting temperature is selected, the Fuzzy key value and the intake air temperature at that time are compared to select the setting temperature automatically according to the Fuzzy rule.
- While in Fuzzy operation, the airflow speed of the indoor fan is set to the high or the medium according to the intake air temperature and the setting temperature.

■ Airflow Speed Selection

- The airflow speed of the indoor fan is set to high, medium, low, or chaos (auto) by the input of the airflow speed selection key on the remote control.

■ On-Timer Operation

- When the set time is reached after the time is input by the remote control, the appliance starts to operate.
- The timer LED is on when the on-timer is input. It is off when the time set by the timer is reached.
- If the appliance is operating at the time set by the timer, the operation continues.

■ Off-Timer Operation

- When the set time is reached after the time is input by the remote control, the appliance stops operating.
- The timer LED is on when the off-timer is input. It is off when the time set by the timer is reached.
- If the appliance is on pause at the time set by the timer, the pause continues.

■ Off-Timer ↔ On-Timer Operation

- When the set time is reached after the on/off time is input by the remote control, the on/off-timer operation is carried out according to the set time.

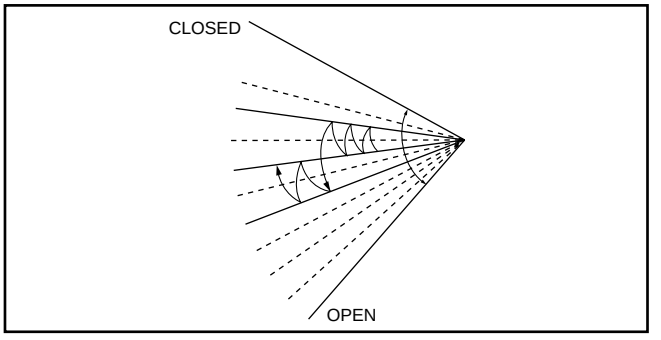
■ Sleep Timer Operation

- When the sleep time is reached after <1,2,3,4,5,6,7,0(cancel) hour > is input by the remote control while in appliance operation, the operation of the appliance stops.
- While the appliance is on pause, the sleep timer mode cannot be input.
- While in cooling mode operation, 30 min later since the start of the sleep timer, the setting temperature increases by 1°C. After another 30 min elapse, it increases by 1°C again.
- When the sleep timer mode is input while in cooling cycle mode, the airflow speed of the indoor fan is set to the low.
- When the sleep timer mode is input while in heating cycle mode, the airflow speed of the indoor fan is set to the medium.

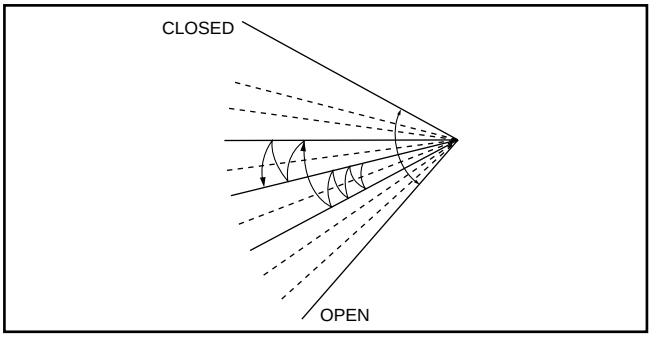
■ Chaos Swing Mode

- By the Chaos Swing key input, the louvers vane automatically operate with the Chaos Swing or they are fixed to the desired direction.
- While in Chaos Swing mode, the angles of cooling and heating cycle operations are different.

< Cooling Mode >



< Heating Mode >



■ Jet Cool Mode Operation

- While in heating mode or Fuzzy operation, the Jet Cool key cannot be input. When it is input while in the other mode operation (cooling, dehumidification, ventilation), the Jet Cool mode is operated.
- In the Jet Cool mode, the indoor fan is operated at super-high speed for 30 min at cooling mode operation.
- In the Jet Cool mode operation, the room temperature is controlled to the setting temperature, 18°C.
- When the sleep timer mode is input while in the Jet Cool mode operation, the Jet Cool mode has the priority.
- During the JET HEAT function at any moment, the A/C starts to blow the hot air with side louvers closed at extremely high speed for 60 minutes setting the room temperature automatically to 30°C.

■ Forced Operation

- Operation procedures when the remote control can't be used.
- The operation will be started if the power button is pressed.
- If you want to stop operation, re-press the button.

	Room temperature ≥ 24°C	21°C ≤ Room temperature < 24°C	Room temperature < 21°C
Operating mode	Cooling	Healthy Dehumidification	Heating
Indoor FAN Speed	High	High	High
Setting Temperature	22°C	23°C	24°C

- While in forced operation, the key input by the remote control has no effect and the buzzer sounds 10 times to indicate the forced operation.

■ Test operation

- During the TEST OPERATION, the unit operates in cooling mode at high speed fan, regardless of room temperature and resets in 18±1 minutes.
- During test operation, if remote controller signal is received, the unit operates as remote controller sets. If you want to use this operation, open the front panel upward and Press the power button let it be pressed for about 3 seconds.
- If you want to stop the operation, re-press the button.

■ Auto restart

- In case the power comes on again after a power failure, Auto Restarting Operation is the function to operate procedures automatically to the previous operating conditions.

■ Remote Control Operation Mode

- When the remote control is selected by the slide switch on the main unit, the appliance operates according to the input by the remote control.

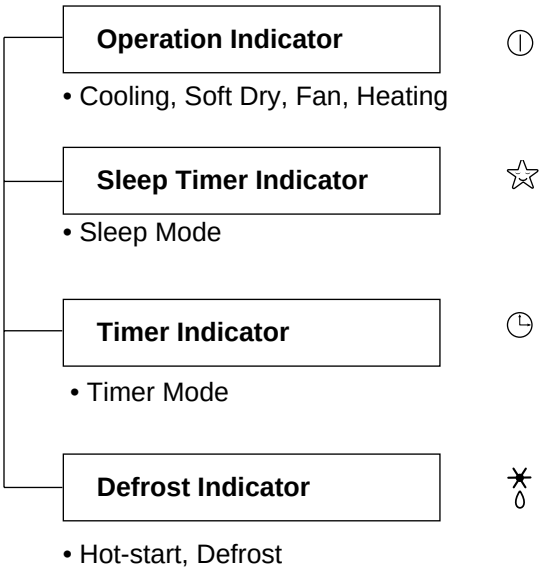
■ Protection of the evaporator pipe from frosting

- If the indoor pipe temperature is below 0°C in 7 min. after the compressor operates without any pause while in cooling cycle operation mode, the compressor and the outdoor fan are turned off in order to protect the indoor evaporator pipe from frosting.
- When the indoor pipe temperature is 7°C or higher after 3 min. pause of the compressor, the compressor and the outdoor fan is turned on according to the condition of the room temperature.

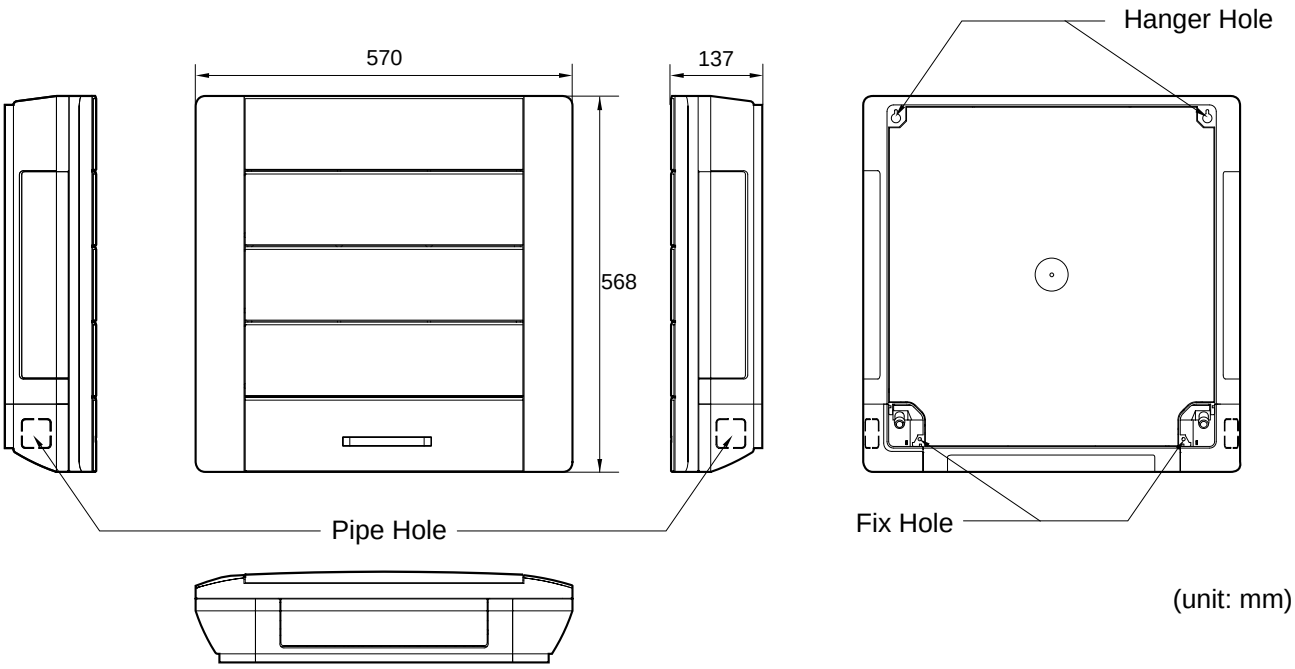
■ Buzzer Sounding Operation

- When the appliance-operation key is input by the remote control, the short "beep-beep-" sounds.
- When the appliance-pause key is input by the remote control, the long "beep—" sounds.
- When a key is input by the remote control while the slide switch on the main unit of the appliance is on the forced operation position, the error sound "beep-beep-beep-beep-beep-" is made 10 times to indicate that the remote control signal cannot be received.

4. Display Function



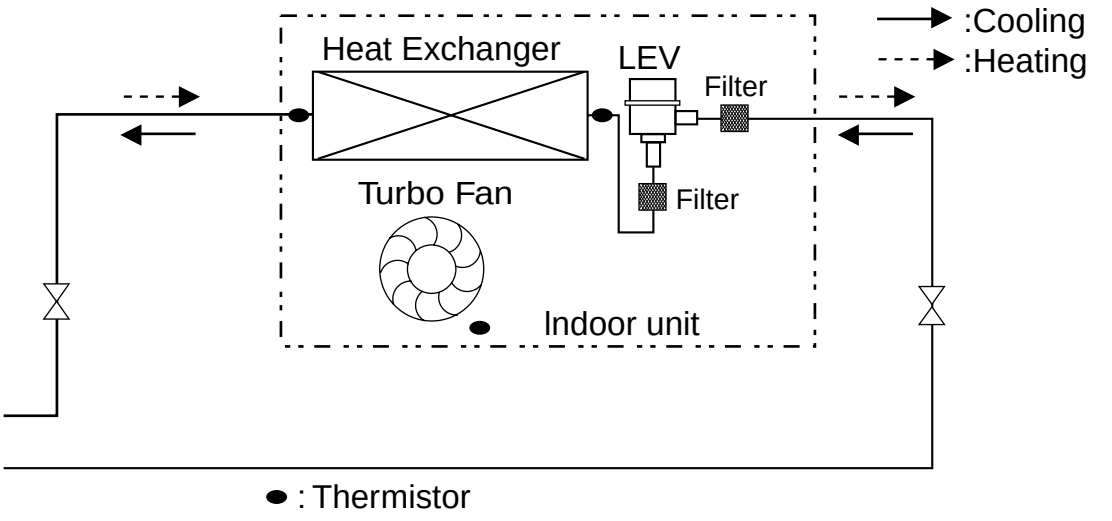
5. Dimensional Drawings



(unit: mm)

Model	W	H	D
CRNN096SP*0 CRNN126SP*0	570	570	137

6. Piping Diagrams

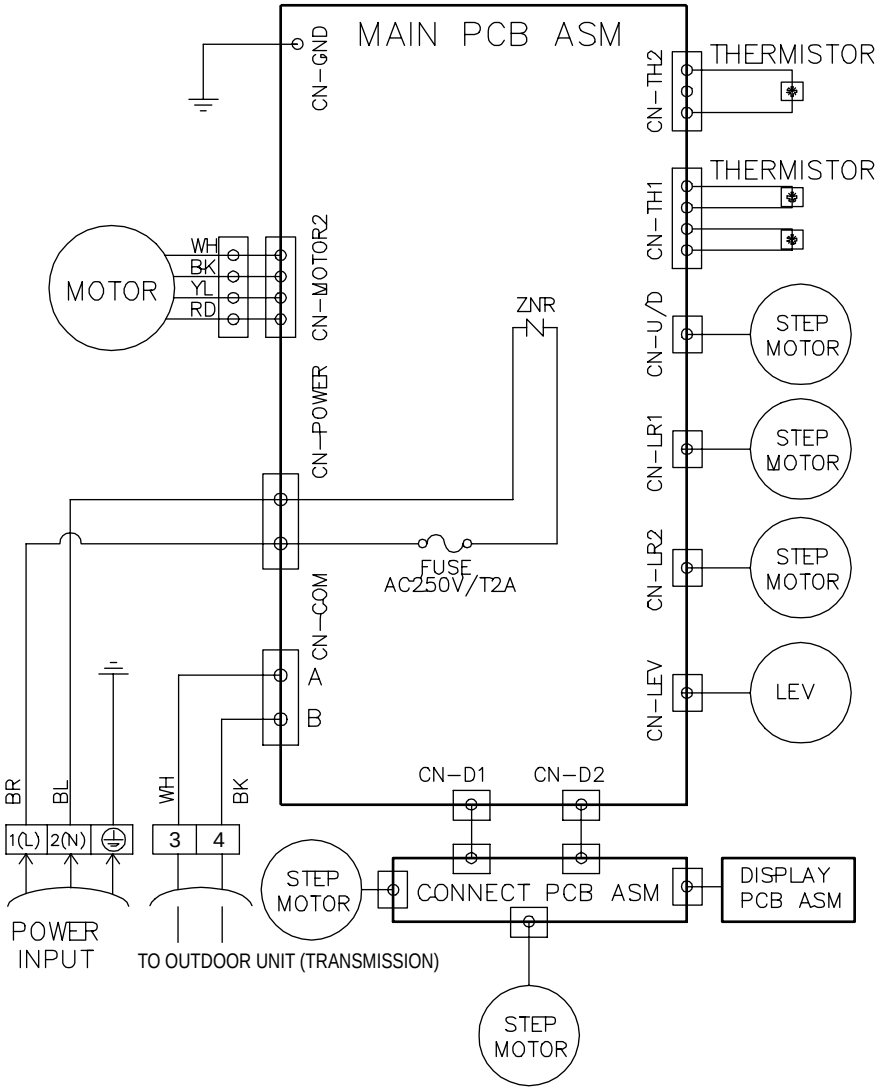


Refrigerant pipe connection port diameter

[unit: mm(inch)]

Model	Gas	Liquid
CRNN096SP*0 CRNN126SP*0	12.7(1/2)	6.35(1/4)

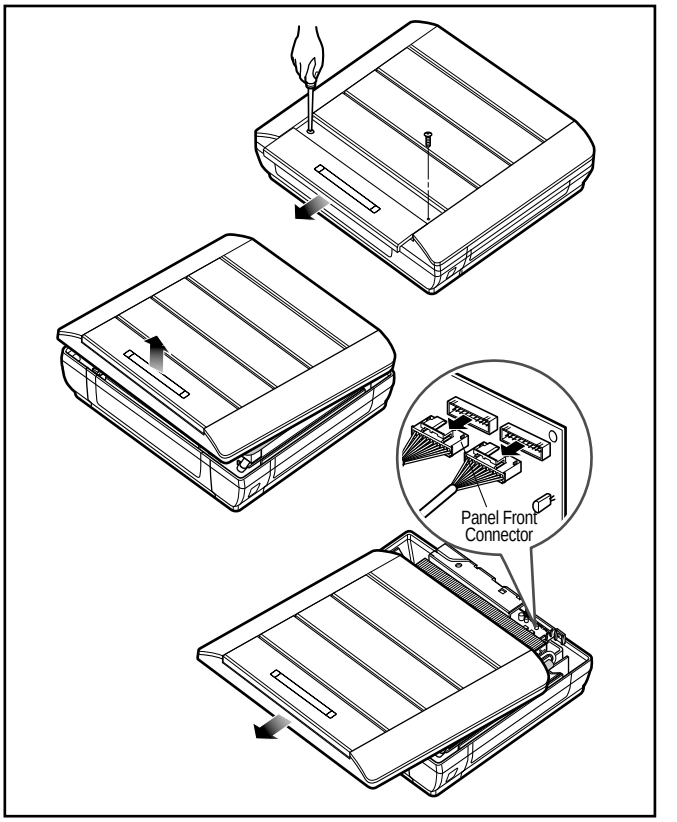
7. Wiring Diagrams



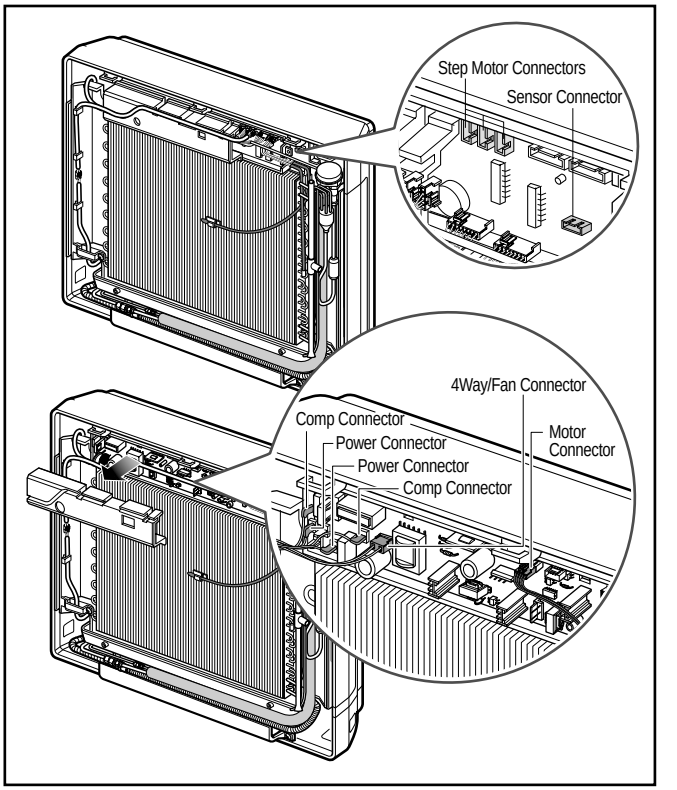
CONNECTOR NUMBER	SPEC	COLOR	DESCRIPTION
CN-POWER	AC POWER SUPPLY	WHITE	AC POWER LINE INPUT FOR INDOOR CONTROLLER
CN-MOTOR2	BLDC FAN MOTOR OUTPUT	WHITE	MOTOR OUTPUT OF BLDC
CN-COM	COMMUNICATION	WHITE	COMMUNICATION BETWEEN INDOOR AND OUTDOOR
CN-LEV	LEV OUTPUT	WHITE	LEV CONTROL OUTPUT
CN-DISP1	DISPLAY	BLUE	DISPLAY OF INDOOR STATUS
CN-DISP2	DISPLAY	WHITE	DISPLAY OF INDOOR STATUS
CN-LEV	LEV OUTPUT	WHITE	LEV CONTROL OUTPUT
CN-LR1	STEP MOTOR	WHITE	STEP MOTOR OUTPUT FOR LEFT/RIGHT
CN-LR2	STEP MOTOR	WHITE	STEP MOTOR OUTPUT FOR LEFT/RIGHT
CN-UD	STEP MOTOR	BLUE	STEP MOTOR OUTPUT
CN-TH1	ROOM/PIPE SENSOR	WHITE	ROOM & PIPE THERMISTOR
CN-TH2	DISCHARGE PIPE SENSOR	RED	DISCHARGE PIPE THERMISTOR

8. Disassembly of the parts

Warning :
Disconnect the unit from power supply before making any checks.
Be sure the power switch is set to “OFF”.

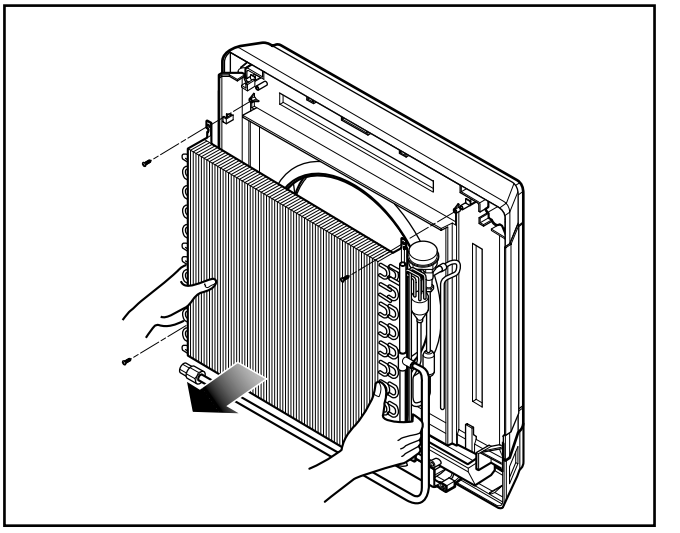


1. To remove the Grille from the Chassis.
- Pull the grille bottom, the remove 2 securing screws.
- Lift the both lower parts of panel front.
- After pull down this panel a bit, separate connecting wire with product.

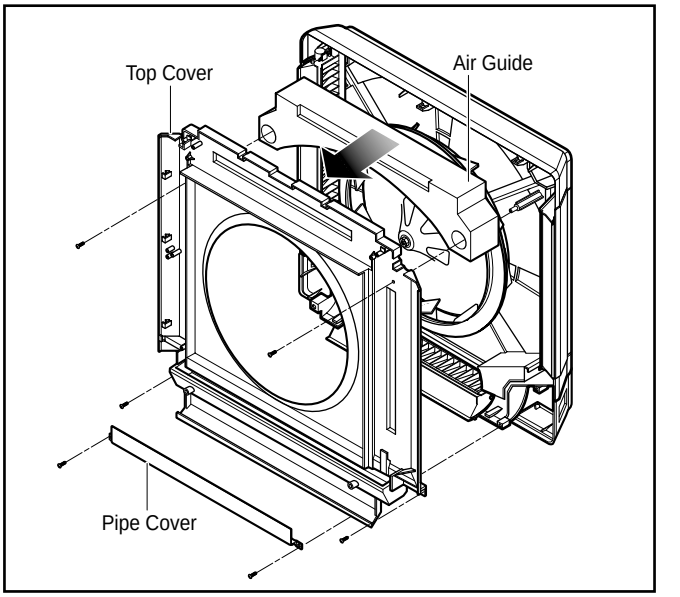


2. To remove the Control Box.
- Before removing the control box, be sure to disconnect the wires from PWB.
- Pull the cover control out from the control box and disconnect other wires.
- Remove securing screws.
- Pull the control box out from the chassis carefully.

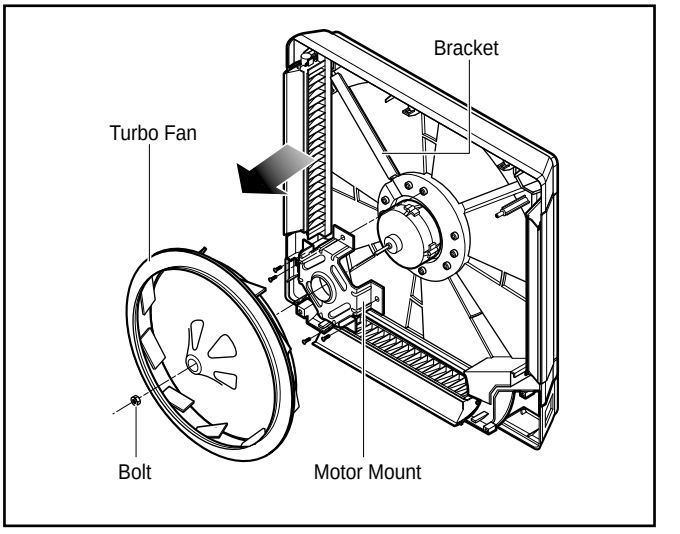
3. To remove the Evaporator.
- Remove 4 screws securing the evaporator.
- Pull the evaporator out from the chassis carefully.



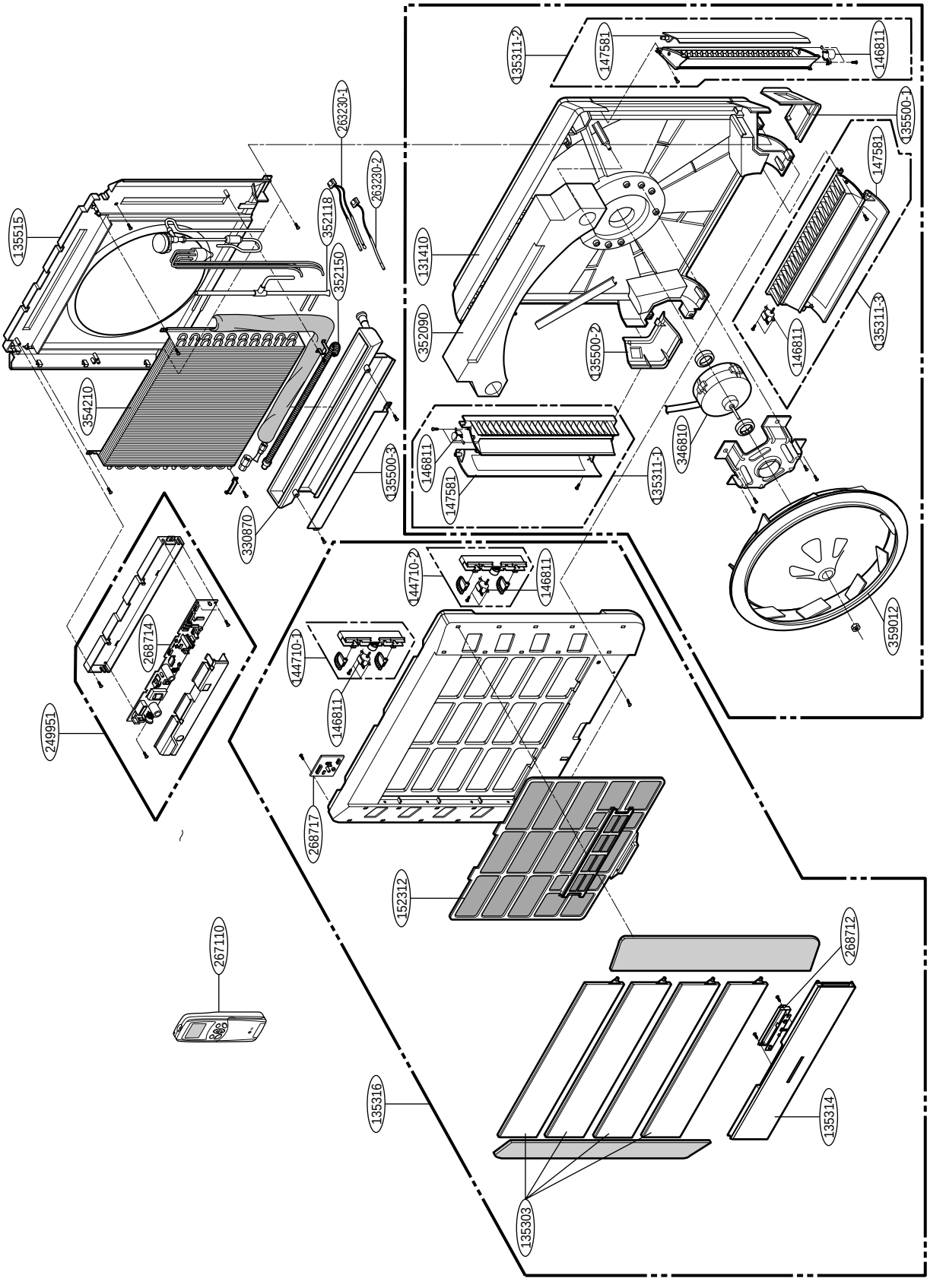
4. Before removing the Turbo Fan.
- Remove the securing screws from the chassis.
- Pull the pipe cover, top cover and the air guide.



5. To remove the Motor.
- Remove the securing bolt from the motor shaft.
- Pull the fan out from the motor shaft.
- Remove 4 screws securing motor mount from the chassis and lift up the motor mount and the bracket.



9. Exploded View



10. Replacement Parts List

LOCATION No.	DESCRIPTION		PART No.		REMARKS
			CRNN096SP*0	CRNN126SP*0	
131410	CHASSIS ASSEMBLY		3141A20004F		R
135303	GRILLE,INLET	BLEU	3530A10071B		R
		WOOD	3530A10071C		R
		METAL	3530A10071D		R
135311-1	GRILLE ASSEMBLY,DISCHARGE(INDOOR)		3531A20069E		R
135311-2	GRILLE ASSEMBLY,DISCHARGE(INDOOR)		3531A20069D		R
135311-3	GRILLE ASSEMBLY,DISCHARGE(INDOOR)		3531A20069L		R
135314	GRILLE ASSEMBLY,INLET	BLEU	3531A20113B		R
		WOOD	3531A20113C		R
		METAL	3531A20113A		R
135316	GRILLE ASSEMBLY,FRONT(INDOOR)	BLEU	3531A10161Y		R
		WOOD	3531A10161X		R
		METAL	3531A10145S		R
135500-1	COVER		3550A20123A		R
135500-2	COVER		3550A20124A		R
135500-3	COVER		3550A20060A		R
135515	COVER ASSY,TOP(INDOOR)		3551A20031A		R
144710-1	GEAR ASSEMBLY		4471A20001C		R
144710-2	GEAR ASSEMBLY		4471A20001D		R
146811	MOTOR ASSEMBLY,STEP		4681A20055A		R
147581	LOUVER,HORIZONTAL		4758A20014B		R
152312	FILTER ASSEMBLY,AIR CLEANER		5231A20005A		R
249951	CONTROL BOX ASSEMBLY,INDOOR		4995A20270K	4995A20270A	R
263230-1	THERMISTOR ASSEMBLY		6323A20004J		R
263230-2	THERMISTOR ASSEMBLY		6323AQ3226W		R
267110	REMOTE CONTROLLER ASSEMBLY		6711A20039P		R
268712	PWB(PCB) ASSEMBLY,DISPLAY		6871A20238B		R
268714	PWB(PCB) ASSEMBLY,MAIN		6871A10088V	6871A10088A	R
268717	PWB(PCB) ASSEMBLY,SUB		6871A30027A		R
330870	DRAIN PAN ASSEMBLY		3087A30004A		R
346810	MOTOR ASSEMBLY,INDOOR		4681A20047B		R
352090	AIR GUIDE		5238A10007A		R
352115	TUBE ASSEMBLY,EVAPORATOR IN		5211A10393A		R
352118	TUBE ASSEMBLY,MENIFOLD(INDOOR)		5211A20983A		R
352150	HOSE ASSY,DRAIN		5251AR1222Q		R
354210	EVAPORATOR ASSEMBLY,FIRST		5421A20072A		R
359012	FAN,TURBO		5900A00003A		R

CRNN-SV
Art Cool Type(Wide)

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1. Specifications

Model		Unit	CRNN126SV*0	CRNN186SV*0
Cooling Capacity		W	3,500	5,300
		kcal/h	3,009	4,557
		Btu/h	11,942	18,084
Heating Capacity		W	3,938	5,963
		kcal/h	3,385	5,127
		Btu/h	13,435	20,345
Dimensions (W*H*D)		mm	928*522*147	928*522*147
		inch	36.5*20.6*5.8	36.5*20.6*5.8
Coil	Rows x Columns x FPI		-	-
	Face Area	m^2	-	-
Moisture removal		*l*/h.	1.5	1.8
Fan	Type		Turbo Fan	Turbo Fan
	Motor Output x Number	W	12.9*2	12.9*2
	Air Flow Rate(High)	cmm	10	12
		cfm	353	424
	Drive		Direct	Direct
	Speed control		BLDC	BLDC
Temperature Control			Microprocessor, Thermostat for cooling and heating	
Sound Absorbing Thermal Insulation Material			Foamed polystyrene	Foamed polystyrene
Safety Device			Fuse	Fuse
Pipe Connections	Liquid Side	mm(inch)	6.35 (1/4)	9.52 (3/8)
	Gas Side	mm(inch)	12.7 (1/2)	15.88 (5/8)
	Drain Pipe(Internal Dia.)	mm	12.2	12.2
Net Weight		kg(lbs)	15(33)	15(33)
Noise Level (Sound Press,1m, H/M/L)		dBA±3	43 / 42 / 40	45 / 43 / 41
Power Supply		Ø,V,Hz	1, 220~240, 50	1, 220~240, 50
Power Cable		AWG#:P*mm^2	12:3*2.5	12:3*2.5
Refrigerant Control			L.E.V	L.E.V
Standard Accessories			Operation Manual, Installation Manual, Installation Panel, Paper Pattern for Installation, Clamps, Screws	
Front Panel Color ('*' Position)			M: Metal, D: Wood, B: Blue	

Notes:-

1. Capacities are based on the following conditions:
   - Cooling: - Indoor Temperature 27°C(80.6°F) DB /19°C(66.2°F) WB
     - Outdoor Temperature 35°C(95°F) DB /24°C(75.2°F) WB
     - Interconnecting Piping Length 7.5m
     - Level Difference of Zero.
   - Heating: - Indoor Temperature 20°C(68°F) DB / 15°C(59°F) WB
     - Outdoor Temperature 7°C(44.6°F) DB / 6°C(42.8°F) WB
     - Interconnecting Piping Length 7.5 m
     - Level Difference of Zero.
2. Capacities are Net Capacities.
3. Due to our policy of innovation some specifications may be changed without notification.
4. L.E.V. : Linear Expansion Valve

Conversion Formula
kcal/h = kW x 860
Btu/h = kW x 3414
cfm = m^3/min x 35.3

2. Installation

Indoor Unit

Operation ON/OFF by Remote controller

Sensing the Room Temperature

• Room temperature sensor. (THERMISTOR)

Room temperature control

• Maintains the room temperature in accordance with the Setting Temp.

Starting Current Control

• Indoor fan is delayed for 5 sec at the starting.

Time Delay Safety Control

• Restarting is inhibited for approx. 3 minutes.

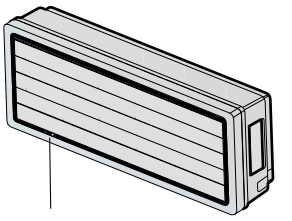
Indoor Fan Speed Control

• High, Med, Low, CHAOS

Operation indication Lamps (LED)

Signal Receptor
Receives the signals from the remote control.(Signal receiving sound: two short beeps or one long beep.)
Operation Indication Lamps

⏻	On/Off	: Lights up during the system operation.
☆	Sleep Mode	: Lights up during Sleep Mode Auto operation.
🕒	Timer	: Lights up during Timer operation.
❄	Defrost Mode	: Lights up during Defrost Mode or Hot Start operation.



Operation indication lamps

Soft Dry Operation Mode

• Intermittent operation of fan at low speed.

Sleep Mode Auto Control

• The fan is switched to low(Cooling), med(Heating) speed.
• The unit will be stopped after 1, 2, 3, 4, 5, 6, 7 hours.

Natural Air Control by CHAOS Logic

• The fan is switched to intermittent or irregular operation
• The fan speed is automatically switched from high to low speed.

Airflow Direction Control

• The louver can be set at the desired position or swing up and down automatically.

Defrost(Deice) control (Heating)

• Both the indoor and outdoor fan stops during defrosting.

Hot-start Control (Heating)

• The indoor fan does not rotate until the evaporator pipe temperature will be reached at 28°C.

3. Operation Details

1. MAIN UNIT FUNCTION

• DISPLAY

Operation Indicator

- ON while in appliance operation, OFF while in appliance pause.
- Flashing while in disconnection or short in Thermistor. (3 sec off / 0.5 sec on)

Sleep Timer Indicator

- ON while in sleep timer mode, OFF when sleep timer cancel or appliance operation pause.

Timer Indicator

- ON while in timer mode (on/off), OFF when timer mode is completed or canceled.

Defrost Indicator

- OFF except when hot start during heating mode operation or while in defrost control.

■ Cooling Mode Operation

- When the intake air temperature reaches 0.5°C below the setting temp, the compressor and the outdoor fan stop.
- When it reaches 0.5°C above the setting temp, they start to operate again.
  Compressor ON Temp ➲ Setting Temp+0.5°C
  Compressor OFF Temp ➲ Setting Temp-0.5°C
- While in compressor running, operating with the airflow speed set by the remote control. While in compressor not running, operating with the low airflow speed regardless of the setting.

■ Healthy Dehumidification Mode

- When the dehumidification operation input by the remote control is received, the intake air temperature is detected and the setting temp is automatically set according to the intake air temperature.
  26°C ≤ Intake Air Temp ➲ 25°C
  24°C ≤ Intake Intake Air Temp<26°C ➲ Intake Air Temp-1°C
  18°C ≤ Intake Intake Air Temp<24°C ➲ Intake Air Temp-0.5°C
  Intake Air Temp<18°C ➲ 18°C

- While in compressor off, the indoor fan repeats low airflow speed and pause.
- While the intake air temp is between compressor on temp. and compressor off temp., 10-min dehumidification operation and 4-min compressor off repeat.
  Compressor ON Temp. ➲ Setting Temp+0.5°C
  Compressor OFF Temp. ➲ Setting Temp-0.5°C
- In 10-min dehumidification operation, the indoor fan operates with the low airflow speed.

■ Heating Mode Operation

- When the intake air temp reaches +3°…above the setting temp, the compressor is turned off. When below the setting temp, the compressor is turned on.
  Compressor ON Temp. ➲ Setting Temp.
  Compressor OFF Temp. ➲ Setting Temp.+3°C
- While in compressor on, the indoor fan is off when the indoor pipe temp. is below 20°C, when above 28°C , it operates with the low or setting airflow speed. When the indoor pipe temp is between 20°C and 28°C, it operates with Super-Low(while in sleep mode, with the medium airflow speed).
- While in compressor off, the indoor fan is off when the indoor pipe temp is below 33°C, when above 35°C , it operates with the low airflow speed.
- If overloaded while in heating mode operation, in order to prevent the compressor from OLP operation, the outdoor fan is turned on/off according to the indoor pipe temp.
- While in defrost control, both of the indoor and outdoor fans are turned off.

■ Defrost Control

- While in heating mode operation in order to protect the evaporator pipe of the outdoor unit from freezing, reversed to cooling cycle to defrost the evaporator pipe of the outdoor unit.
- After 40 min heating mode operation, at 4 min interval, whether to carry out defrost control or not and the time of defrost control are determined according to the following conditions.

1) While in heating mode operation, the maximum of the indoor pipe temperature is measured and it is compared with the present indoor pipe temperature to get the difference of the indoor pipe temperatures (=the maximum temperature of indoor pipe ? the present temperature of indoor pipe), according to which, whether to carry out defrost control or not is determined.
2) According to the need of defrost control shown above and the elapsed time of heating mode operation at that moment, the defrost control time is determined.
3) When the determined time of defrost control is below 7 min, heating mode operation continues without carrying out defrost control. According to the procedure stated above, the determination is made again. When the defrost control time is 7 min or longer, defrost control is then carried out.

- While in defrost control, the minimum temp of the indoor pipe is measured and it is compared with the present temp of the indoor pipe to get the difference of the indoor pipe temperatures (=the present temperature of the indoor pipe ? the minimum temperature of the indoor pipe). When the difference is 5°C or higher, defrost control is completed and heating mode operation is carried out.
- While in defrost control, if the defrost time determined before the start of defrost control is completed, defrost control stops and heating mode operation is carried out regardless of the above condition.
- When the indoor pipe temp is 42°C or above, defrost control is not carried out even if the condition is one of the defrost conditions above.
- While in defrost control, the compressor is on and the indoor fan, the outdoor fan, and the 4 way valve are off.

■ Fuzzy Operation

- When any of operation mode is not selected like the moment of the power on or when 3 hrs has passed since the operation off, the operation mode is selected.
- When determining the operation mode, the compressor, the outdoor fan, and the 4 way valve are off and only the indoor fan is operated for 15 seconds. Then an operation mode is selected according to the intake air temp at that moment as follows.

  24°C ≤ Inatake Air Temp ➲ Fuzzy Operation for Cooling
  21°C ≤ Inatake Air Temp<24°C ➲ Fuzzy Operation for Dehumidification
  Inatake Air Temp<21°C ➲ Fuzzy Operation for Heating
- If any of the operation modes among cooling / dehumidification / heating mode operations is carried out for 10 sec or longer before Fuzzy operation, the mode before Fuzzy operation is operated.

1) Fuzzy Operation for Cooling

- According to the setting temperature selected by Fuzzy rule, when the intake air temp is 0.5°C or more below the setting temp, the compressor is turned off. When 0.5°C or more above the setting temp, the compressor is turned on.

  Compressor ON Temp ➲ Setting Temp +0.5°C
  Compressor OFF Temp ➲ Setting Temp + 0.5°C
- At the beginning of Fuzzy mode operation, the setting temperature is automatically selected according to the intake air temp at that time.

  26°C≤ Intake Air Temp ➲ 25°C
  24°C≤ Intake Air Temp<26°C ➲ Intake Air Temp + 1°C
  22°C≤ Intake Air Temp<24°C ➲ Intake Air Temp + 0.5°C
  18°C≤ Intake Air Temp<22°C ➲ Intake Air Temp
  Intake Air Temp<18°C ➲ 18°C
- When the Fuzzy key (Temperature Control key) is input after the initial setting temperature is selected, the Fuzzy key value and the intake air temperature at that time are compared to select the setting temperature automatically according to the Fuzzy rule.
- While in Fuzzy operation, the airflow speed of the indoor fan is automatically selected according to the temperature.

2) Fuzzy Operation for Dehumidification

- According to the setting temperature selected by Fuzzy rule, when the intake air temp is 0.5°C or more below the setting temp, the compressor is turned off. When 0.5°C or more above the setting temp, the compressor is turned on.

  Compressor ON Temp ➲ Setting Temp + 0.5°C
  Compressor OFF Temp ➲ Setting Temp+0.5°C
- At the beginning of Fuzzy mode operation, the setting temperature is automatically selected according to the intake air temp at that time.

  26°C ≤ Intake Air Temp ➲ 25°C
  24°C ≤ Intake Air Temp<26°C ➲ Intake Air Temp+1°C
  22°C ≤ Intake Air Temp<24°C ➲ Intake Air Temp+0.5°C
  18°C ≤ Intake Air Temp<22°C ➲ Intake Air Temp
  Intake Air Temp<18°C ➲ 18°C
- When the Fuzzy key (Temperature Control key) is input after the initial setting temperature is selected, the Fuzzy key value and the intake air temperature at that time are compared to select the setting temperature automatically according to the Fuzzy rule.
- While in Fuzzy operation, the airflow speed of the indoor fan repeats the low airflow speed or pause as in dehumidification operation.

3) Fuzzy Operation for Heating

- According to the setting temperature selected by Fuzzy rule, when the intake air temp is 3°C or more above the setting temp, the compressor is turned off. When below the setting temp, the compressor is turned on.
  Compressor ON Temp ➲ Setting Temp
  Compressor OFF Temp ➲ Setting Temp + 3°C
- At the beginning of Fuzzy mode operation, the setting temperature is automatically selected according to the intake air temp at that time.
  20°C≤Intake Air Temp ➲ Intake Air Temp + 0.5°C
  Intake Air Temp<20°C ➲ 20°C
- When the Fuzzy key (Temperature Control key) is input after the initial setting temperature is selected, the Fuzzy key value and the intake air temperature at that time are compared to select the setting temperature automatically according to the Fuzzy rule.
- While in Fuzzy operation, the airflow speed of the indoor fan is set to the high or the medium according to the intake air temperature and the setting temperature.

■ Airflow Speed Selection

- The airflow speed of the indoor fan is set to high, medium, low, or chaos (auto) by the input of the airflow speed selection key on the remote control.

■ On-Timer Operation

- When the set time is reached after the time is input by the remote control, the appliance starts to operate.
- The timer LED is on when the on-timer is input. It is off when the time set by the timer is reached.
- If the appliance is operating at the time set by the timer, the operation continues.

■ Off-Timer Operation

- When the set time is reached after the time is input by the remote control, the appliance stops operating.
- The timer LED is on when the off-timer is input. It is off when the time set by the timer is reached.
- If the appliance is on pause at the time set by the timer, the pause continues.

■ Off-Timer ↔ On-Timer Operation

- When the set time is reached after the on/off time is input by the remote control, the on/off-timer operation is carried out according to the set time.

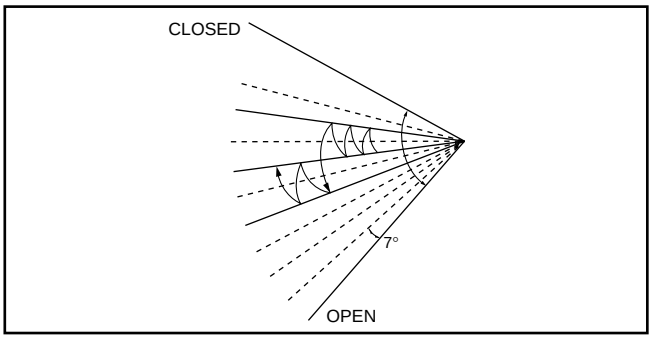
■ Sleep Timer Operation

- When the sleep time is reached after <1,2,3,4,5,6,7,0(cancel) hr> is input by the remote control while in appliance operation, the operation of the appliance stops.
- While the appliance is on pause, the sleep timer mode cannot be input.
- While in cooling mode operation, 30 min later since the start of the sleep timer, the setting temperature increases by 1°C. After another 30 min elapse, it increases by 1°C again.
- When the sleep timer mode is input while in cooling cycle mode, the airflow speed of the indoor fan is set to the low.
- When the sleep timer mode is input while in heating cycle mode, the airflow speed of the indoor fan is set to the medium.

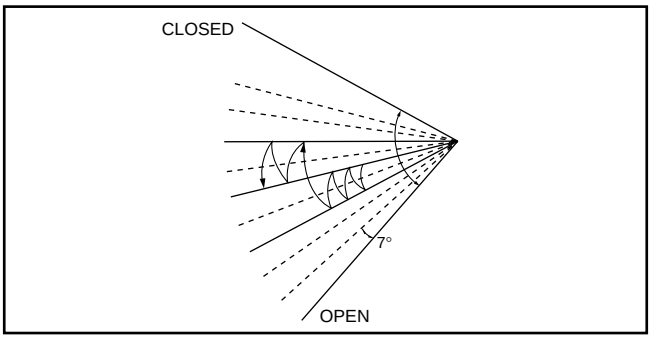
■ Chaos Swing Mode

- By the Chaos Swing key input, the louvers vane automatically operate with the Chaos Swing or they are fixed to the desired direction.
- While in Chaos Swing mode, the angles of cooling and heating cycle operations are different.

< Cooling Mode >



< Heating Mode >



■ Jet Cool Mode Operation (H/P Model)

- While in heating mode or Fuzzy operation, the Jet Cool key cannot be input. When it is input while in the other mode operation (cooling, dehumidification, ventilation), the Jet Cool mode is operated.
- In the Jet Cool mode, the indoor fan is operated at super-high speed for 30 min at cooling mode operation.
- In the Jet Cool mode operation, the room temperature is controlled to the setting temperature, 18°C.
- When the sleep timer mode is input while in the Jet Cool mode operation, the Jet Cool mode has the priority.
- During the JET HEAT function at any moment, the A/C starts to blow the hot air with side louvers closed at extremely high speed for 60 minutes setting the room temp. automatically to 30°C.

■ Forced Operation

- Operation procedures when the remote control can't be used.
- The operation will be started if the power button is pressed.
- If you want to stop operation, re-press the button.

	Room temperature ≥ 24°C	**21°C ≤ Room temperature < 24°C**	**Room temperature < 21°C**
Operating mode	Cooling	Healthy Dehumidification	Heating
Indoor FAN Speed	High	High	High
Setting Temperature	22°C	23°C	24°C

- While in forced operation, the key input by the remote control has no effect and the buzzer sounds 10 times to indicate the forced operation.

■ Test operation

- During the TEST OPERATION, the unit operates in cooling mode at high speed fan, regardless of room temperature and resets in 18±1 minutes.
- During test operation, if remote controller signal is received, the unit operates as remote controller sets. If you want to use this operation, open the front panel upward and Press the power button let it be pressed for about 3 seconds.
- If you want to stop the operation, re-press the button.

■ Auto restart

- In case the power comes on again after a power failure, Auto Restarting Operation is the function to operate procedures automatically to the previous operating conditions.

■ Remote Control Operation Mode

- When the remote control is selected by the slide switch on the main unit, the appliance operates according to the input by the remote control.

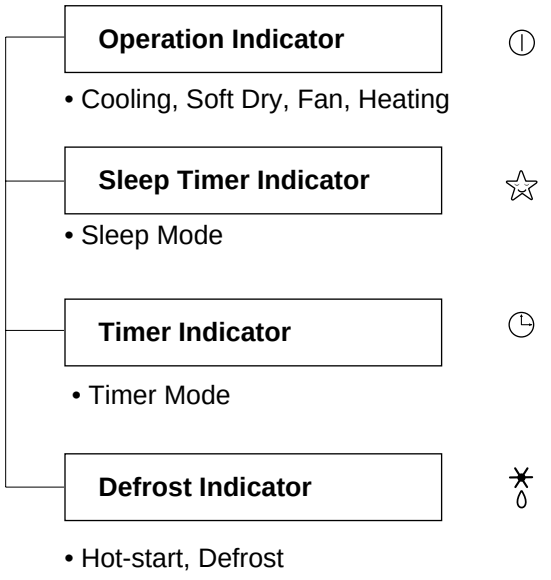
■ Protection of the evaporator pipe from frosting

- If the indoor pipe temp is below 0°C in 7 min. after the compressor operates without any pause while in cooling cycle operation mode, the compressor and the outdoor fan are turned off in order to protect the indoor evaporator pipe from frosting.
- When the indoor pipe temp is 7°C or higher after 3 min. pause of the compressor, the compressor and the outdoor fan is turned on according to the condition of the room temperature.

■ Buzzer Sounding Operation

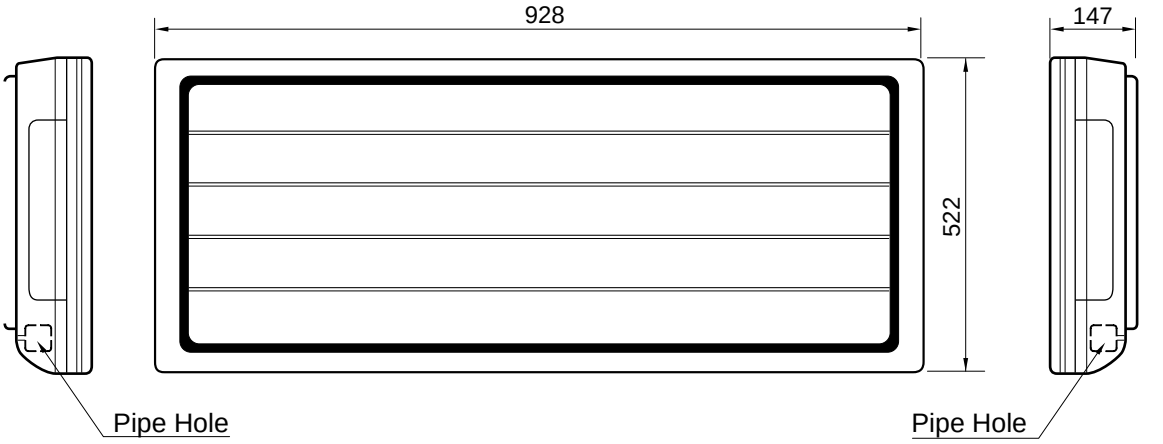
- When the appliance-operation key is input by the remote control, the short "beep-beep-" sounds.
- When the appliance-pause key is input by the remote control, the long "beep—" sounds.
- When a key is input by the remote control while the slide switch on the main unit of the appliance is on the forced operation position, the error sound "beep-beep-beep-beep-beep-" is made 10 times to indicate that the remote control signal cannot be received.

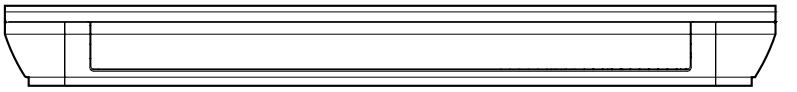
4. Display Function

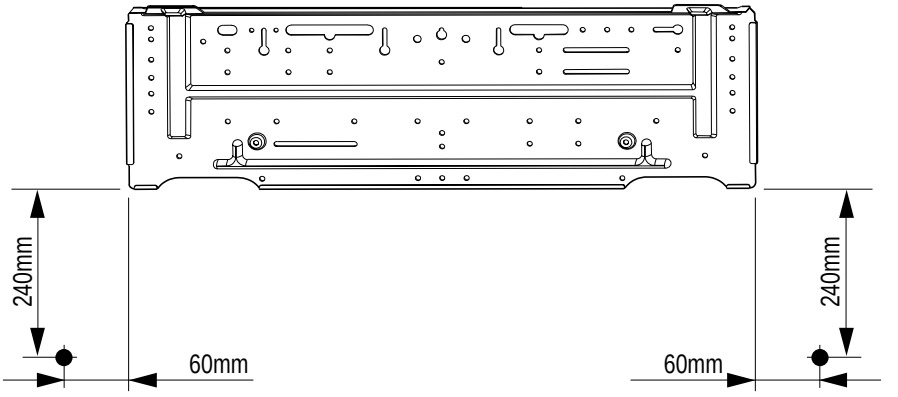


5. Dimensional Drawings

CRNN126SV*0
CRNN186SV*0



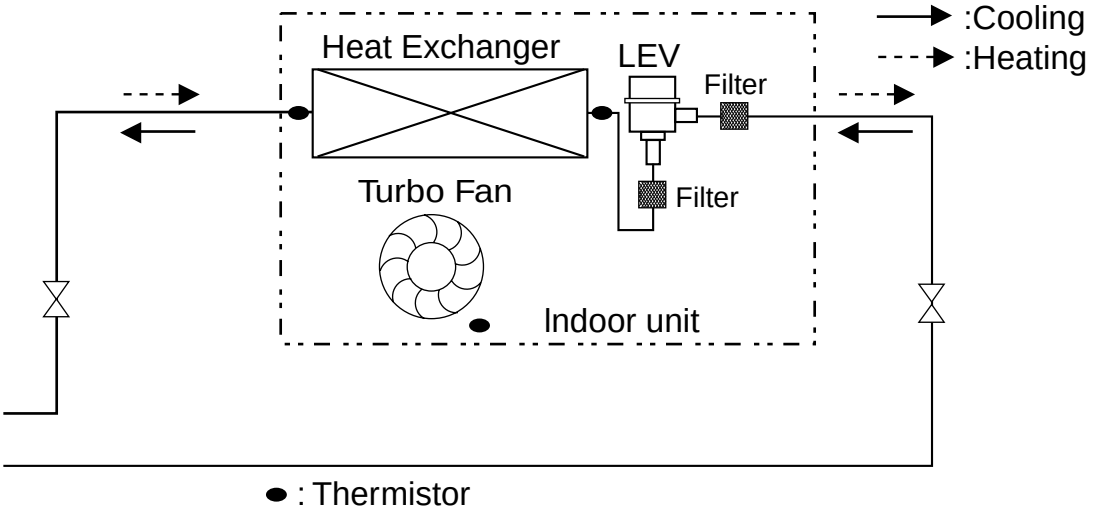




(Unit: mm)

Model	W	H	D
CRNN126SV*0 CRNN186SV*0	928	522	147

6. Piping Diagrams

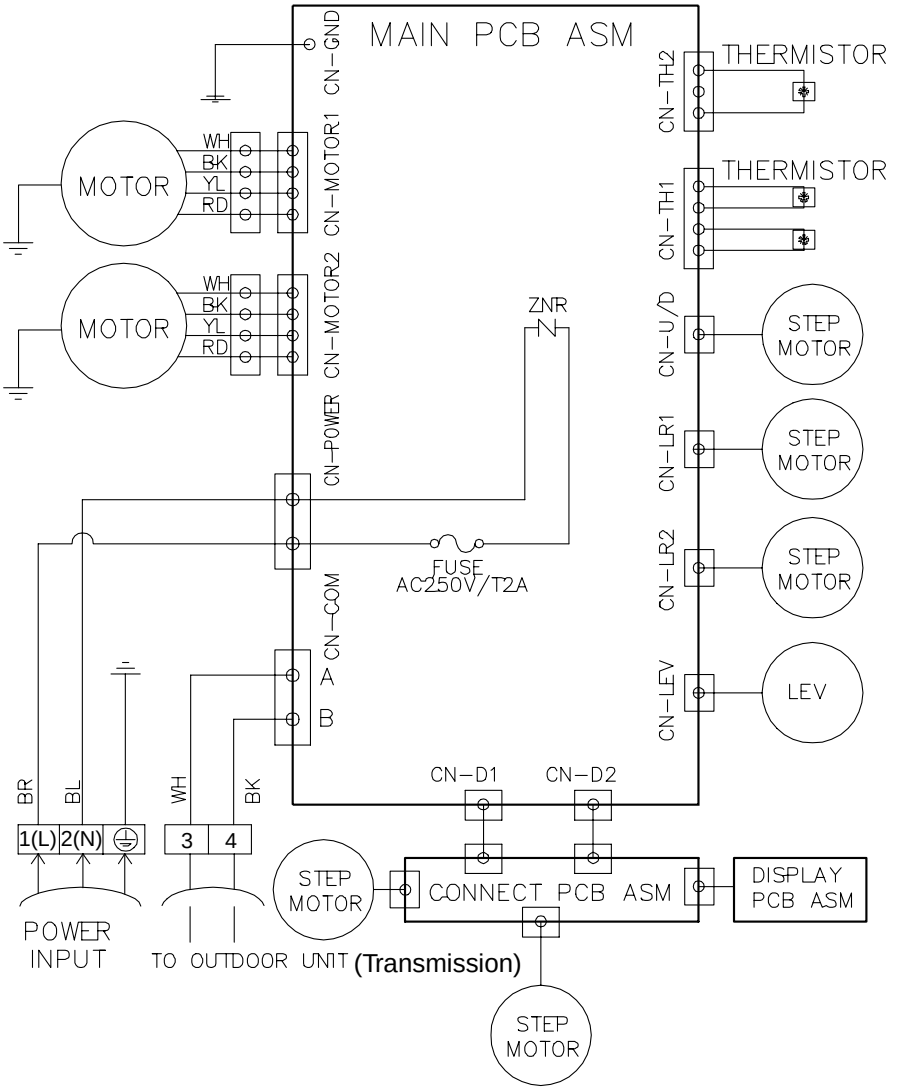


Refrigerant pipe connection port diameter

[unit: mm(inch)]

Model	Gas	Liquid
CRNN126SV*0	15.88(5/8)	9.52(3/8)
CRNN186SV*0		

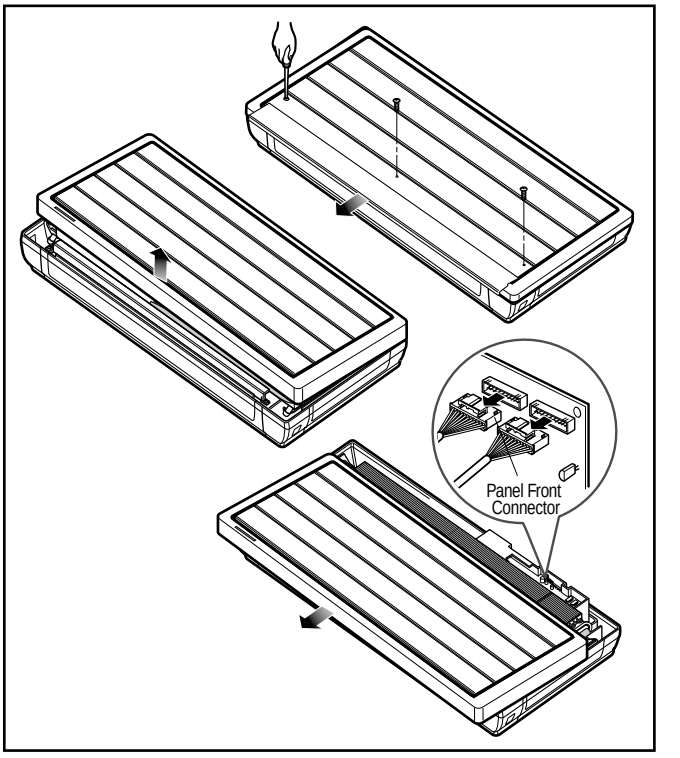
7. Wiring Diagrams



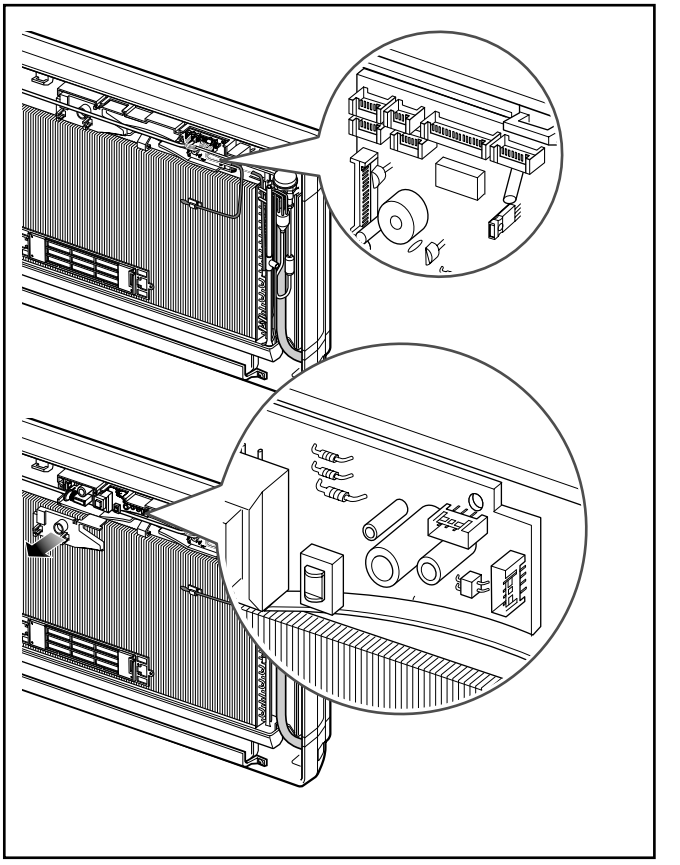
CONNECTOR NUMBER	SPEC	COLOR	DESCRIPTION
CN-POWER	AC POWER SUPPLY	WHITE	AC POWER LINE INPUT FOR INDOOR CONTROLLER
CN-MOTOR2	BLDC FAN MOTOR OUTPUT	WHITE	MOTOR OUTPUT OF BLDC
CN-COM	COMMUNICATION	WHITE	COMMUNICATION BETWEEN INDOOR AND OUTDOOR
CN-LEV	LEV OUTPUT	WHITE	LEV CONTROL OUTPUT
CN-DISP1	DISPLAY	BLUE	DISPLAY OF INDOOR STATUS
CN-DISP2	DISPLAY	WHITE	DISPLAY OF INDOOR STATUS
CN-LEV	LEV OUTPUT	WHITE	LEV CONTROL OUTPUT
CN-LR1	STEP MOTOR	WHITE	STEP MOTOR OUTPUT FOR LEFT/RIGHT
CN-LR2	STEP MOTOR	WHITE	STEP MOTOR OUTPUT FOR LEFT/RIGHT
CN-UD	STEP MOTOR	BLUE	STEP MOTOR OUTPUT
CN-TH1	ROOM/PIPE SENSOR	WHITE	ROOM & PIPE THERMISTOR
CN-TH2	DISCHARGE PIPE SENSOR	RED	DISCHARGE PIPE THERMISTOR

8. Disassembly of the parts

Warning :
Disconnect the unit from power supply before making any checks.
Be sure the power switch is set to “OFF”.

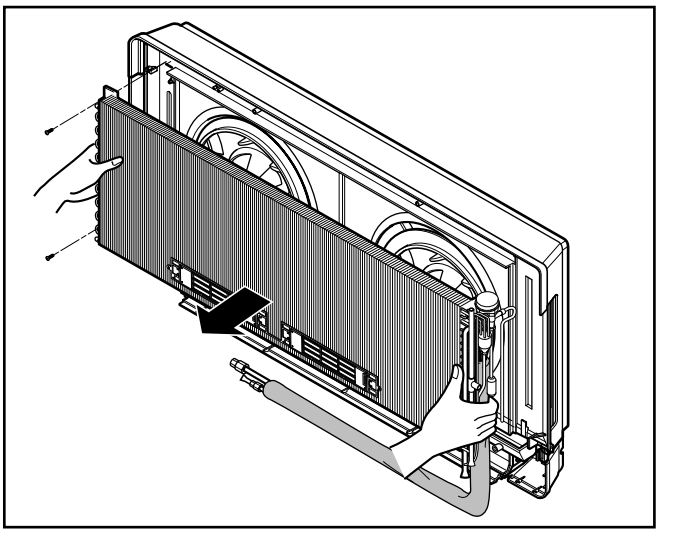


1. To remove the Grille from the Chassis.
- Push mark[ ] on the grille bottom then pull it down and remove 3 securing screws.
- Lift the both lower parts of panel front.
- After pull down this panel a bit, separate connecting wire with product.

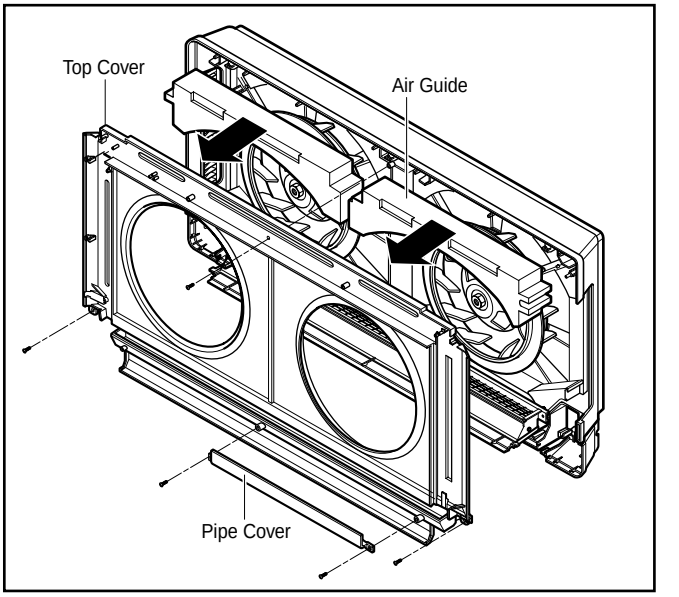


2. To remove the Control Box.
- Before removing the control box, be sure to disconnect the wires from PWB.
- Pull the cover control out from the control box and disconnect other wires.
- Remove securing screws.
- Pull the control box out from the chassis carefully.

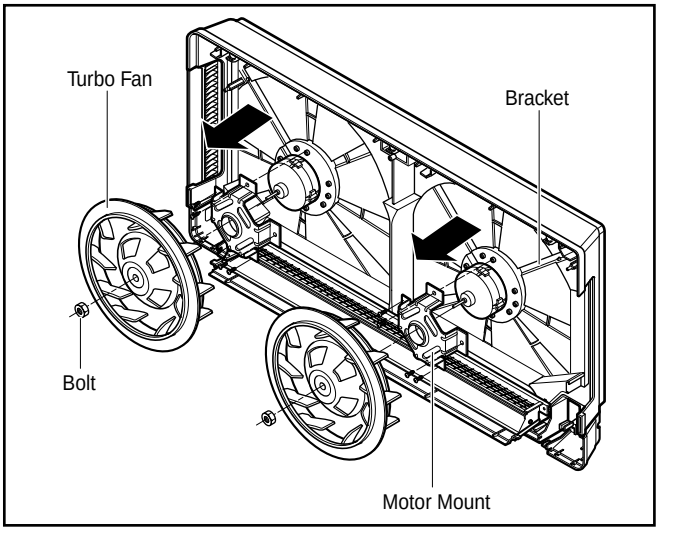
3. To remove the Evaporator.
- Remove 4 screws securing the evaporator.
- Pull the evaporator out from the chassis carefully.



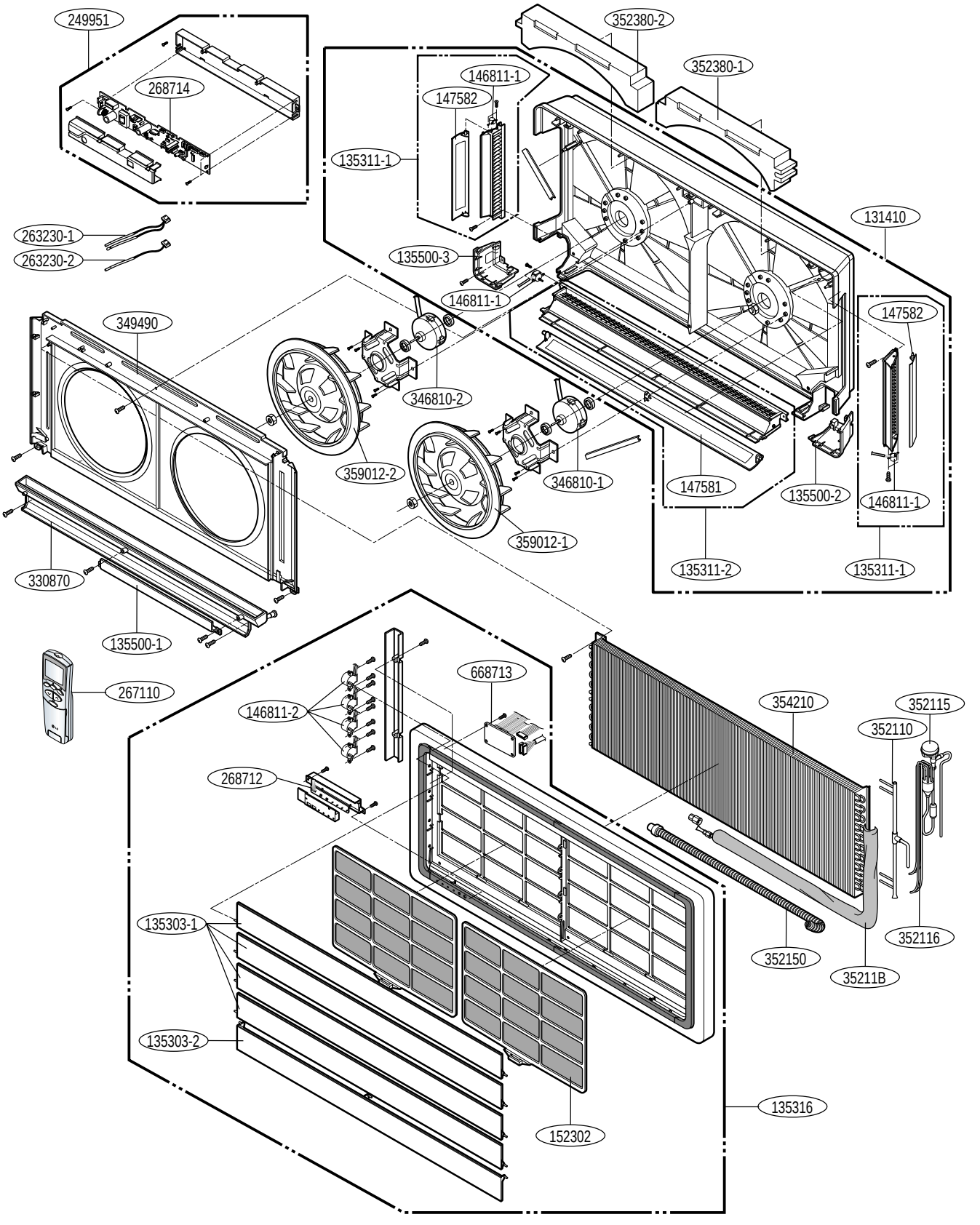
4. Before removing the Turbo Fan.
- Remove the securing screws from the chassis.
- Pull the pipe cover, top cover and the air guide.



5. To remove the Motor.
- Remove the securing bolt from the motor shaft.
- Pull the fan out from the motor shaft.
- Remove 4 screws securing motor mount from the chassis and lift up the motor mount and the bracket.



9. Exploded View



10. Replacement parts List

LOCATION No.	DESCRIPTION		PART No .		REMARKS
			CRNN126SV*0	CRNN186SV*0	
131410	CHASSIS ASSEMBLY		3141A20008A		R
135311-1	GRILLE ASSEMBLY, DISCHARGE(INDOOR)		3531A20124B		R
135311-2	GRILLE ASSEMBLY, DISCHARGE(INDOOR)		3531A20125B		R
135316	GRILLE ASSEMBLY, FRONT(INDOOR)	BLUE	3531A10289A		R
		WOOD	3531A10153V		R
		METAL	3531A10153Z		R
135303-1	GRILLE, INLET	BLUE	3530A10116B		R
		WOOD	3530A10116A		R
		METAL	3530A10116D		R
135303-2	GRILLE, INLET	BLUE	3530A10117B		R
		WOOD	3530A10117A		R
		METAL	3530A10117D		R
135500-1	COVER		3550A20060A		R
135500-2	COVER(RIGHT)		3550A20120B		R
135500-3	COVER(LEFT)		3550A20121B		R
140570	LOCKER ASSEMBLY		3H02857A		R
146811-1	MOTOR ASSEMBLY, STEP		4681A20055A		R
146811-2	MOTOR ASSEMBLY, STEP		4681A20055C		R
147581	LOUVER, HORIZONTAL		4758A20033A		R
147582	LOUVER, VERTICAL		4758A20034A		R
152302	FILTER(MECH), A/C		5230A10006B		R
237900	WINDOW, DISPLAY		3790A20035A		R
249951	CONTROL BOX ASEMBLY, INDOOR		4995A10098J	4995A10098K	R
263230-1	THERMISTOR ASSEMBLY(ROOM, PIPE-IN)		6323A20004J		R
263230-2	THERMISTOR ASSEMBLY(PIPE-OUT)		6323AQ3226V		R
267110	REMOTE CONTROLLER ASSEMBLY		6711A20039P		R
268712	PWB(PCB) ASSEMBLY, DISPLAY		6871A20250A		R
268714	PWB(PCB) ASSEMBLY, MAIN		6871A10088T	6871A10088U	R
330870	DRAIN PAN ASSEMBLY		3087A20013A		R
346810-1	MOTOR ASSEMBLY, INDOOR(R)		4681A20047C		R
346810-2	MOTOR ASSEMBLY, INDOOR(L)		4681A20047D		R
349490	ORIFICE ASSEMBLY		4949A20002A		R
352115	TUBE ASSEMBLY, EVAPORATOR IN		5211A10423A		R
352116	TUBE ASSEMBLY, EVAPORATOR OUT		5211A20301H		R
35211B	TUBE ASSEMBLY, TUBING		5211A10424A		R
352150	HOSE ASSEMBLY, DRAIN		5251AR1222Q		R
352380-1	AIR GUIDE(R)		5238A10009A		R
352380-2	AIR GUIDE(L)		5238A10010A		R
354210	EVAPORATOR ASSEMBLY, FIRST		5421A20104A		R
359012-1	FAN, TURBO(L)		5900A00004A		R
359012-2	FAN, TURBO(R)		5900A00005A		R
668713	PWB(PCB) ASSEMBLY, SUB		6871A30029A		R

CRNN-CAA/CBA/CCA/CDA(With Case) Floor Standing Type

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1. Specifications

Model		Unit	CRNN076CAA0	CRNN096CBA0	CRNN126CBA0	CRNN186CCA0	CRNN246CDA0
Cooling Capacity		W	2,100	2,600	3,500	5,300	7,000
		kcal/h	1,806	2,235	3,009	4,557	6,019
		Btu/h	7,165	8,871	11,942	18,084	23,885
Heating Capacity		W	2,363	2,925	3,938	5,963	7,075
		kcal/h	2,031	2,515	3,385	5,127	6,771
		Btu/h	8,061	9,980	13,435	20,345	26,870
Color			White	White	White	White	White
Dimensions (W*H*D)		mm	1050*620*218	1170*620*218	1170*620*218	1410*620*218	1530*620*218
		inch	41.3*24.4*8.6	46.1*24.4*8.6	46.1*24.4*8.6	55.5*24.4*8.6	60.2*24.4*8.6
Casing			Galvaniged Steel Plate				
Coil	Rows x Columns x FPI		2*9*20	2*9*20	2*9*20	2*9*20	2*9*20
	Face Area	m^2	0.19	0.19	0.19	0.19	0.19
Moisture removal		*l*/h.	1.0	1.2	1.5	1.8	2.2
Fan	Type		Sirroco Fan				
	Motor Output x Number	W	26	26	47	47*2	47*2
	Air Flow Rate(High)	cmm	6.4/5.9/5.4	7.0/6.5/6.0	10.2/9.2/8.2	11.9/10.5/9.2	13.2/11.7
		cfm	226/208/190	247/229/212	360/325/289	420/370/325	466/413/360
	Drive		Direct				
	Speed control		Setps control				
Temperature Control			Micro processor, Thermostat for cooling and heating				
Sound Absorbing Thermal Insulation Material			Foamed Ploystyrene				
Safety Device			Fuse, Thermal Fuse for Fan Motor				
Pipe Connections	Liquid Side	mm(inch)	6.35(1/4)	6.35(1/4)	6.35(1/4)	9.52(3/8)	9.52(3/8)
	Gas Side	mm(inch)	12.7(1/2)	12.7(1/2)	12.7(1/2)	15.88(5/8)	15.88(5/8)
	Drain Pipe(Internal Dia.)	mm	25	25	25	25	25
Net Weight		kg(lbs)	22(48.5)	25(55.1)	25(55.1)	27.5(60.6)	32.5(71.7)
Noise Level (Sound Press,1.5m, H/M/L)		dBA±3	36/34/32	36/34/33	37/35/34	38/36/35	40/38/36
Power Supply		Ø,V,Hz	1, 220~240, 50	1, 220~240, 50	1, 220~240, 50	1, 220~240, 50	1, 220~240, 50
Power Cable		AWG#:P*mm^2	12:3*2.5	12:3*2.5	12:3*2.5	12:3*2.5	12:3*2.5
Refrigerant Control			L.E.V	L.E.V	L.E.V	L.E.V	L.E.V
Standard Accessories			Owner Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Washer fixing Plate, Sealing Pads, Clamps, Screws, Washer for Hanging Bracket, Insulation for Fitting				

Notes:-

1. Capacities are based on the following conditions:
   - Cooling: - Indoor Temperature 27°C(80.6°F) DB /19°C(66.2°F) WB
     - Outdoor Temperature 35°C(95°F) DB /24°C(75.2°F) WB
     - Interconnecting Piping Length 7.5m
     - Level Difference of Zero.
   - Heating: - Indoor Temperature 20°C(68°F) DB / 15°C(59°F) WB
     - Outdoor Temperature 7°C(44.6°F) DB / 6°C(42.8°F) WB
     - Interconnecting Piping Length 7.5 m
     - Level Difference of Zero.
2. Capacities are Net Capacities.
3. Due to our policy of innovation some specifications may be changed without notification.
4. L.E.V. : Linear Expansion Valve

Conversion Formula
kcal/h = kW x 860
Btu/h = kW x 3414
cfm = m^3/min x 35.3

2. Functions

Indoor Unit

- **Operation ON/OFF by Remote controller**
- **Sensing the Room Temperature** • Room temperature sensor. (Thermistor)
- **Room temperature control** • Maintains the room temperature in accordance with the Setting Temperature.
- **Starting Current Control** • Indoor fan is delayed for 5 seconds at the starting.
- **Time Delay Safety Control** • Restarting is inhibited for approx. 3 minutes.
- **Indoor Fan Speed Control** • High, Med, Low
- **Soft Dry Operation Mode** • Intermittent operation of fan at low speed.
- **Auto Restart** • Although the air-conditioner is turned off by a power failure, it is restarted automatically previous operation mode after power supply.
- **Deice (defrost) control (Heating)** • Both the indoor and outdoor fan stops during defrosting. • Hot start after defrost ends.
- **Hot-start Control (Heating)** • The indoor fan sdoes not rotate until the evaporator piping temperature reaches 25°C.
- **Central Control(Optional)** • It is operating individually or totally by central control function.

3. Operation Details

(1) The function of main control

■ Time Delay safety Control

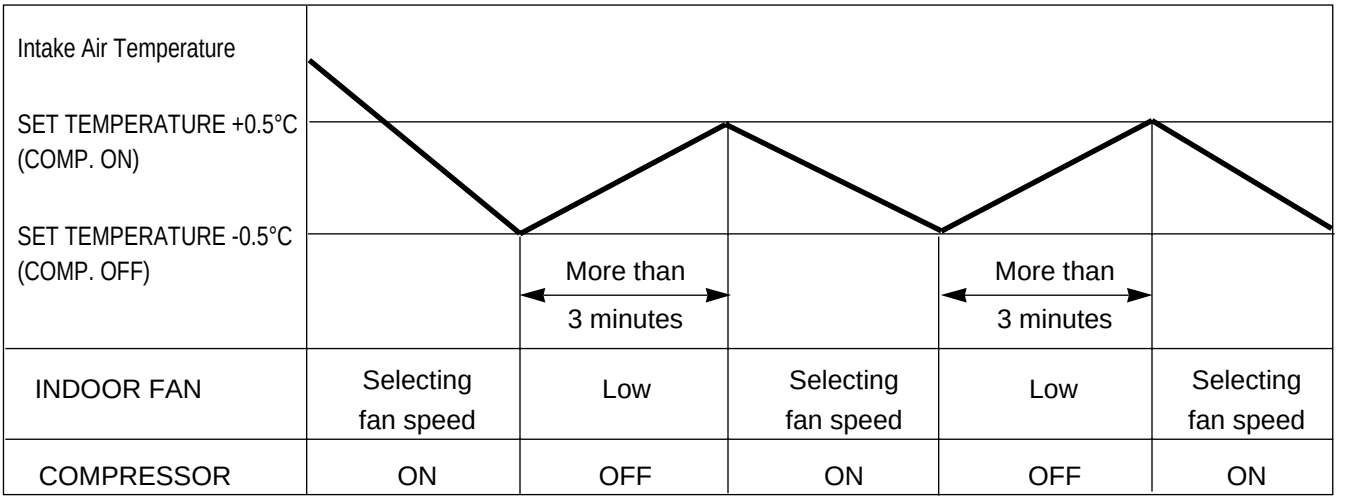
• 30sec··· The 4-way valve is ceased for 30sec. to prevent the refrigerant-gas abnormal noise when the Heating operation is OFF or switched to the other operation mode while compress is off.
While compressor is running, it takes 3~5 seconds to switch to another mode.

■ Soft-Dry Operation

• The indoor fan speed is automatically set to the low, so the shift of the indoor fan speed is impossible because of already being set to the best speed for Dry Operation by microcontroller control.

■ Cooling Mode Operation

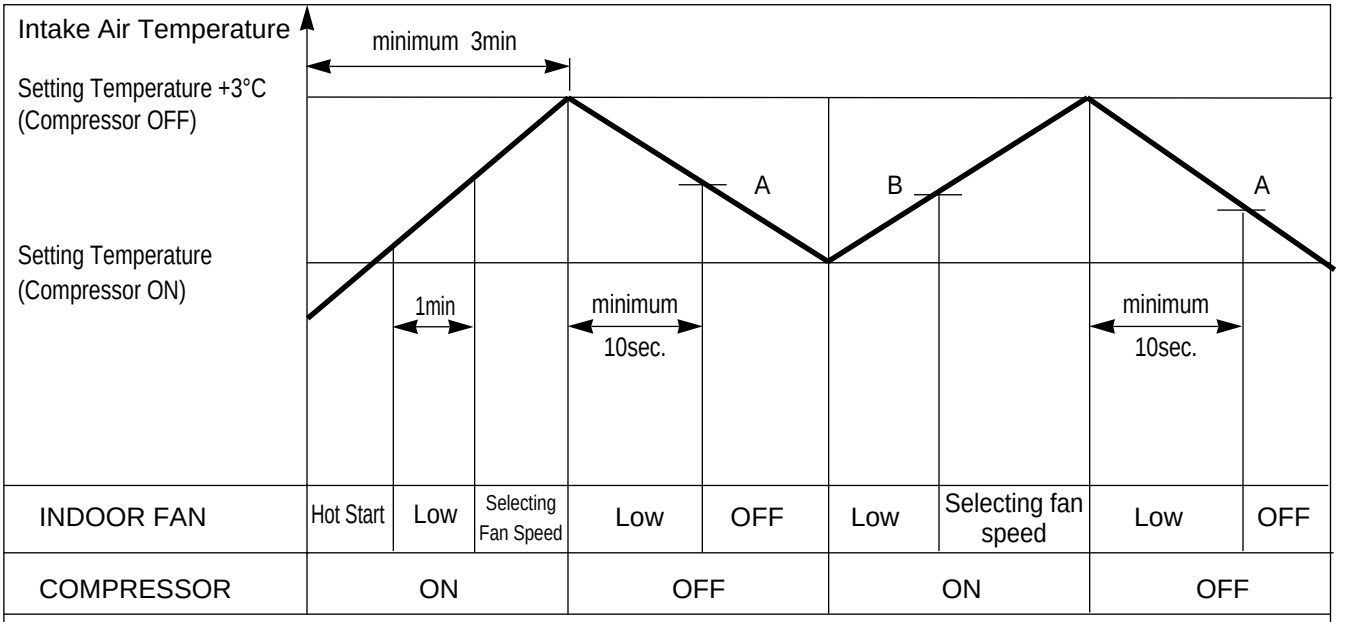
• When selecting the Cooling(❄) Mode Operation, the unit will operate according to the setting by the remote controller and the operation diagram is as following.



INDOOR FAN	Selecting fan speed	Low	Selecting fan speed	Low	Selecting fan speed
COMPRESSOR	ON	OFF	ON	OFF	ON

■ Heating Mode Operation

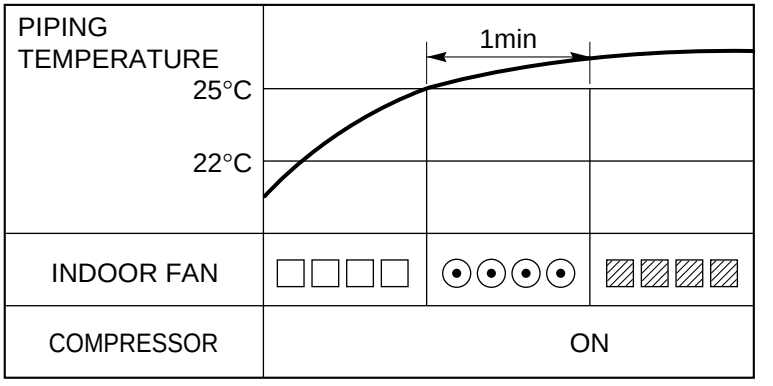
The unit will operate according to the setting by the remote controller and the operation diagram is shown as following.



- A point; While the indoor Heat-Exchanger temperature is higher than 40°C fan operates at low speed, when it becomes lower than 40˚C fan stops.
- B point; When the indoor Heat-Exchanger temperature is higher than 42°C, fan operates at seleted fan speed, when it becomes lower than 39°C, the fan operates at low speed.

■ Hot-Start Control

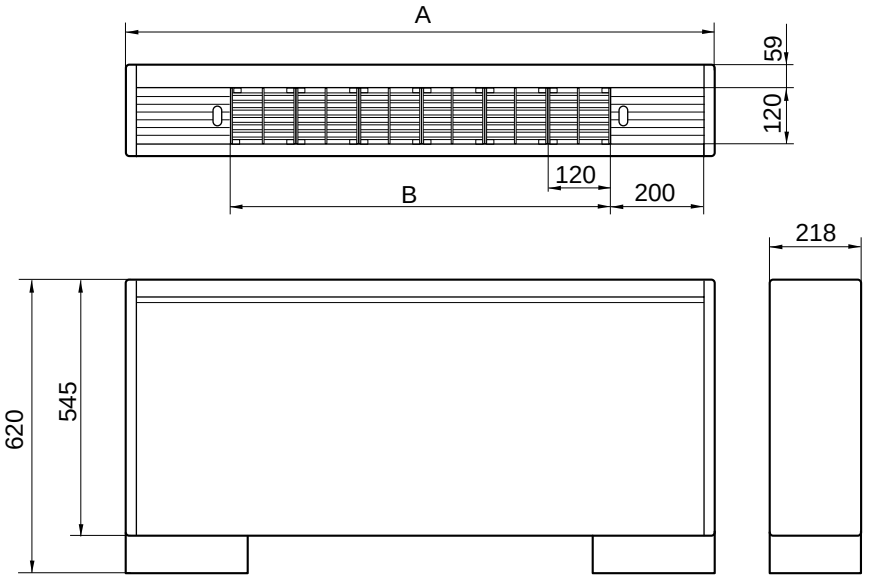
- The indoor fan stops until the evaporator piping temperature reaches 25°C.
- The operation diagram is as following.



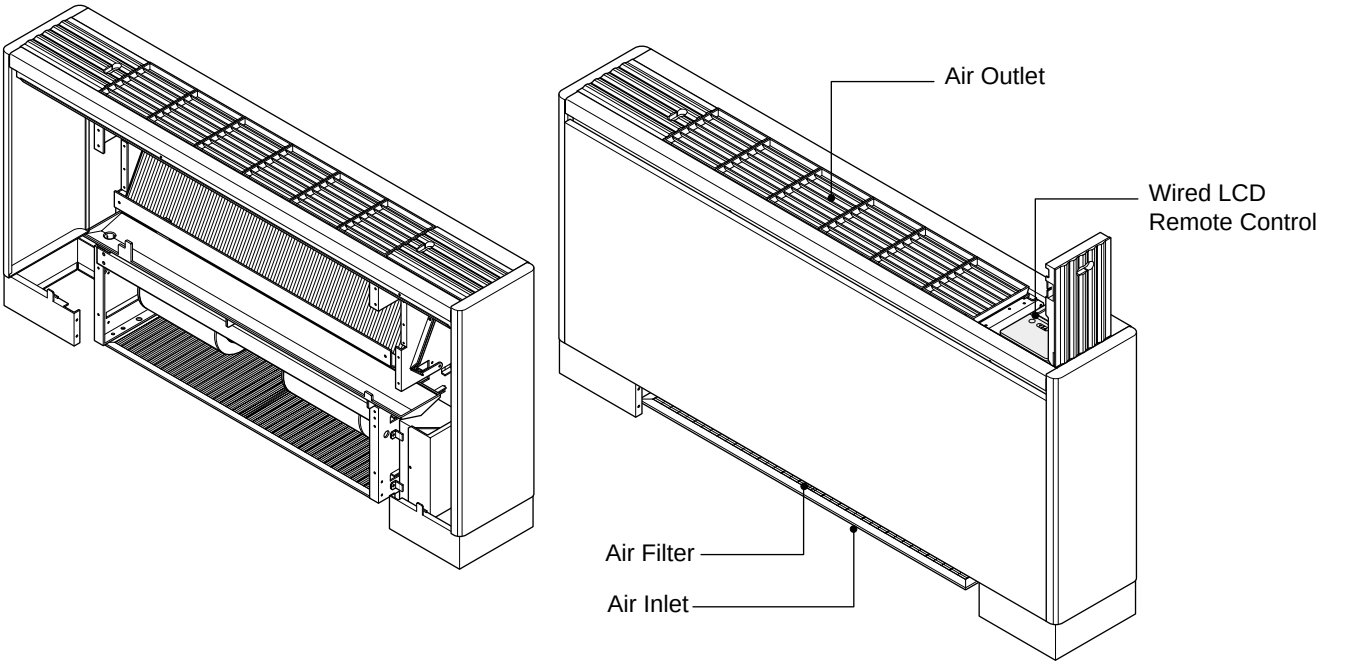
▨ : Selected Fan ⊙ : Low Fan □ : Fan Stop

4. Dimensional Drawings

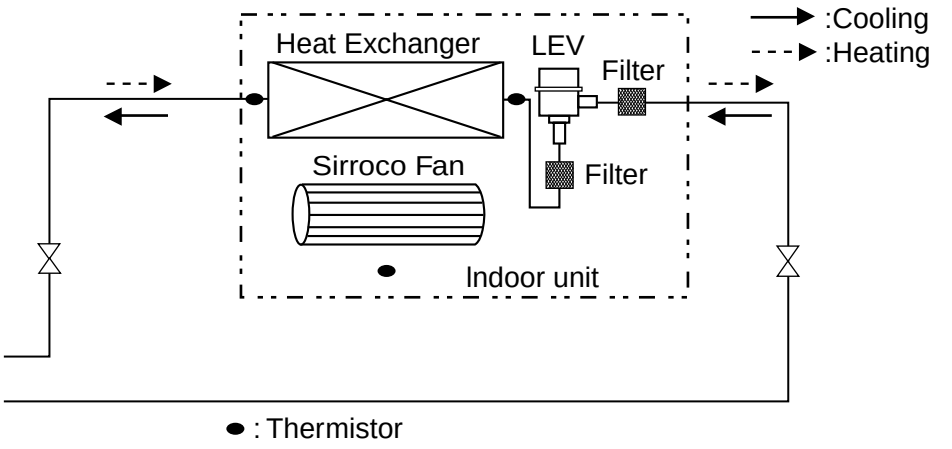
CRNN076CAA0
CRNN096CBA0
CRNN126CBA0
CRNN186CCA0
CRNN246CDA0



Model	A	B
CRNN076CAA0	1,050	600
CRNN096CBA0	1,170	720
CRNN126CBA0	1,170	720
CRNN186CCA0	1,410	960
CRNN246CDA0	1,530	1,080



5. Piping diagrams

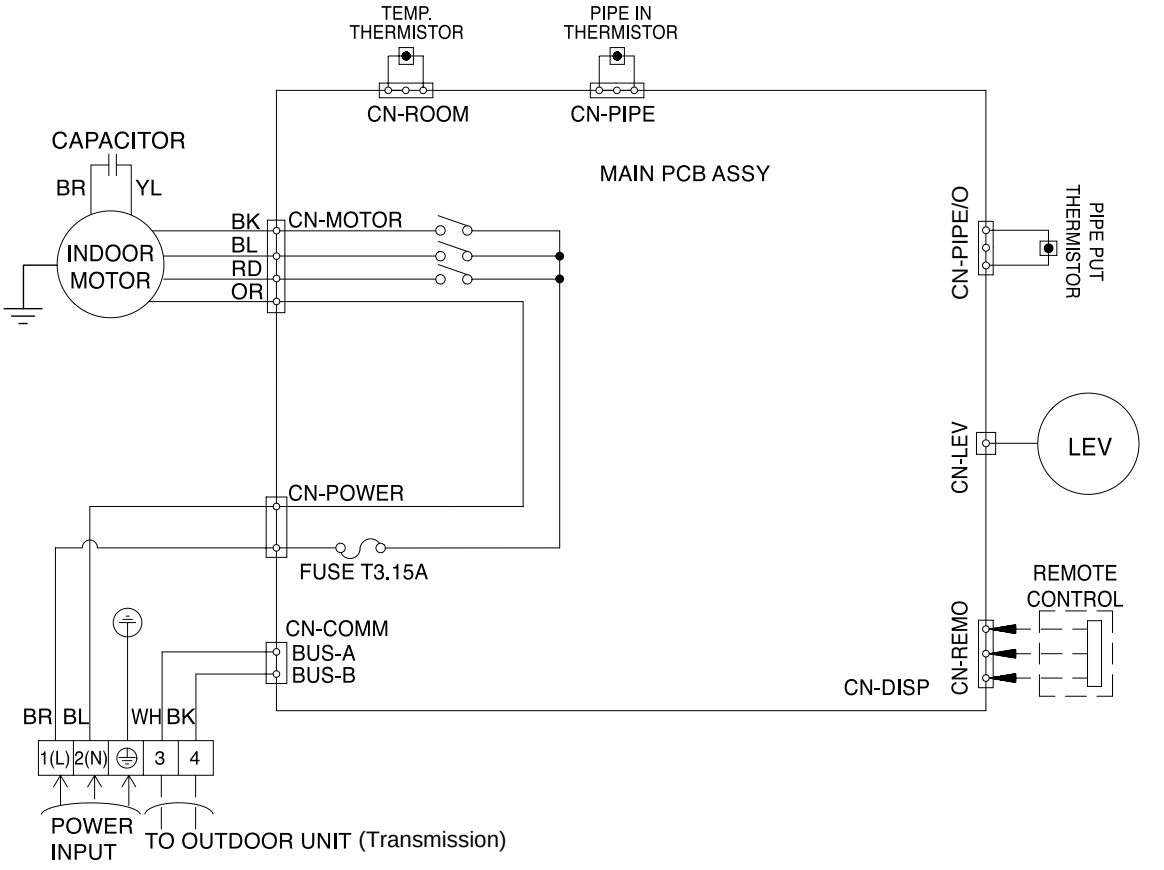


Refrigerant pipe connection port diameter

[unit: mm(inch)]

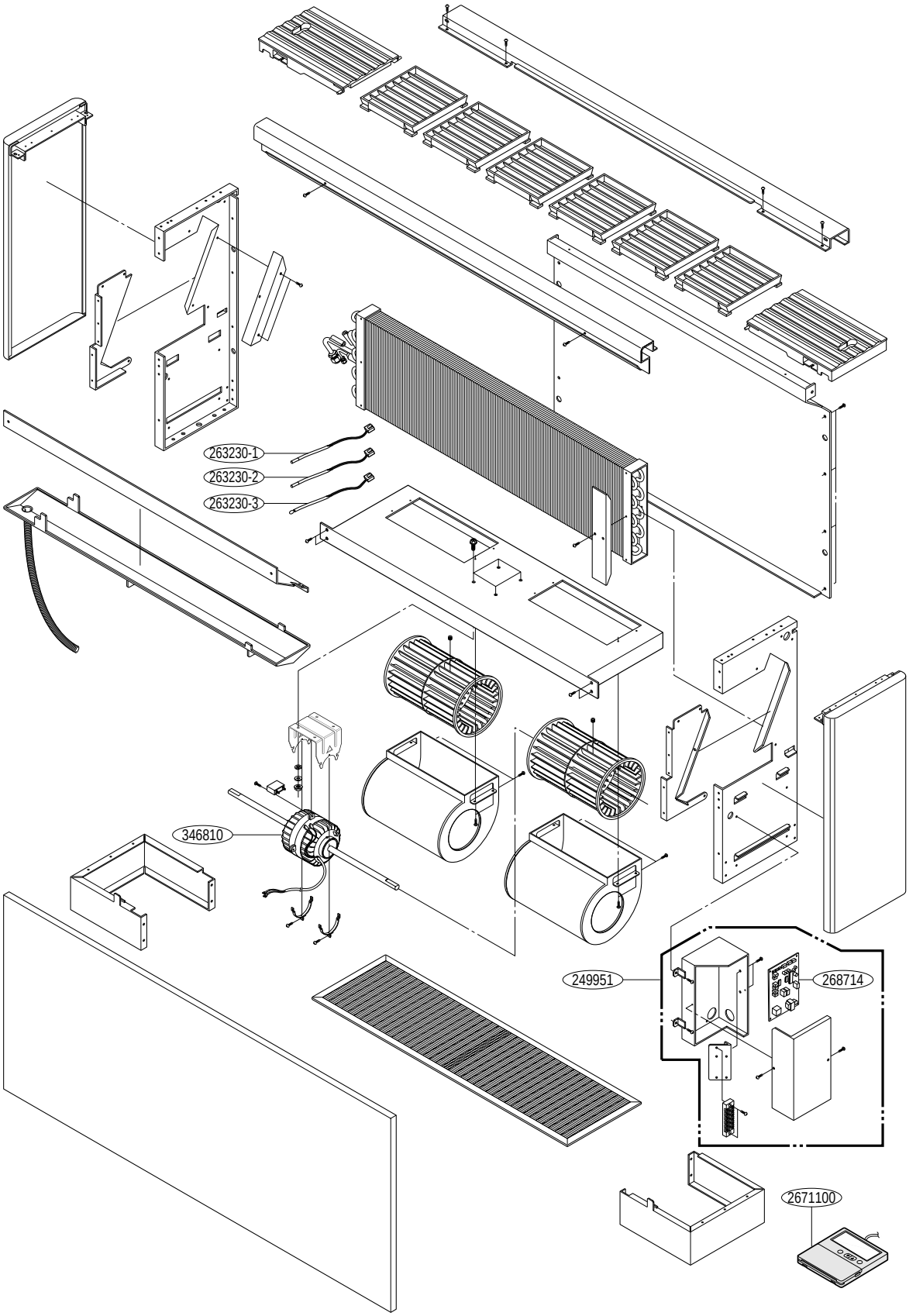
Model	Gas	Liquid
CRNN076CAA0	12.7(1/2)	6.35(1/4)
CRNN096CBA0	12.7(1/2)	6.35(1/4)
CRNN126CBA0	12.7(1/2)	6.35(1/4)
CRNN186CCA0	15.88(5/8)	9.52(3/8)
CRNN246CDA0	15.88(5/8)	9.52(3/8)

6. Wiring Diagrams



CONNECTOR NUMBER	SPEC	COLOR	DESCRIPTION
CN-POWER	AC POWER SUPPLY	WHITE	AC POWER LINE INPUT FOR INDOOR CONTROLLER
CN-MOTOR	AC FAN MOTOR OUTPUT	YELLOW	MOTOR OUTPUT OF PHASE CONTROL
CN-D/PUMP	DRAIN PUMP OUTPUT	WHITE	AC OUTPUT FOR DRAIN PUMP
CN-COMM	COMMUNICATION	WHITE	COMMUNICATION BETWEEN INDOOR AND OUTDOOR
CN-LEV	LEV OUTPUT	WHITE	LEV CONTROL OUTPUT
CN-FLOAT	FLOAT SWITCH INPUT	BLUE	FLOAT SWITCH SENSING
CN-PIPE	PIPE SENSOR	WHITE	PIPE THERMISTOR
CN-PIPE/O	DISCHARGE PIPE SENSOR	RED	DISCHARGE PIPE THERMISTOR
CN-ROOM	ROOM SENSOR	BLUE	ROOM THERMISTOR
CN-REMO	REMOTE CONTROLLER	WHITE	REMOTE CONTROL LINE

8. Exploded View



9. Replacement Parts List

LOCATION NO.	DESCRIPTION	PART NO.					REMARK
		CRNN076CCA0	CRNN096CBA0	CRNN126CBA0	CRNN186CCA0	CRNN246CDA0	
249951	CONTROL BOX ASSEMBLY,INDOOR	4995A20297H	4995A20297J	4995A20297K	4995A20297L	4995A20297M	R
263230-1	THERMISTOR ASSEMBLY(ROOM)	6323A30004E					R
263230-2	THERMISTOR ASSEMBLY(PIPE-IN)	6323A30002A					R
263230-3	THERMISTOR ASSEMBLY(PIPE-OUT)	6323AQ3226T					R
267110	REMOTE CONTROLLER ASSEMBLY	6711A10002D					R
268714	PWB(PCB) ASSEMBLY,MAIN	6871A10108H	6871A10108J	6871A10108K	6871A10108L	6871A10108M	R
346810	MOTOR ASSEMBLY,INDOOR	4681A20100H	4681A20100J	4681A20100K	4681A20100L	4681A20100N	R
346810	MOTOR ASSEMBLY,INDOOR				4681A20100M	4681A20100P	R

Outdoor unit

CRUN Series

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8. Replacement Parts List.....179

1. Specifications

Model		Unit	CRUN458S0	CRUN1008T0
Cooling Capacity		kW	13.0	28.0
		kcal/h	11,178	24,080
		Btu/h	44,358	96,000
Heating Capacity		kW	14.5	31.5
		kcal/h	12,554	27,090
		Btu/h	49,500	108,000
Casing Color			WARM GRAY	WARM GRAY
Dimensions (W*H*D)		mm	900*1,225*370	1,246*1,519*700
		inch	35.43*48.42*13.57	49.07*58.84*27.56
E.E.R	Cooling	Btu/hW	8.24	8.93
	Heating	Btu/hW	10.00	10.24
C.O.P	Cooling	W/W (kcal/hW)	2.56 (2.08)	2.67 (2.25)
	Heating	W/W (kcal/hW)	2.93 (2.37)	3.00 (2.53)
Input	Cooling	kW	5.0	10.5
	Heating	kW	5.2	11.0
Operation limits (Cooling/ Heating)		°C	-5~48 / -15~24	-5 ~48 / -20 ~ 24
Compressor	Model		JT100BEVYE	JT100BEVTYE + JT212DATYE
	Type		Hermetically Sealed Scroll Type	
	Piston Displacement	cm^3/rev	53.4	53.4+117.3
	Number of Revolution	r.p.m	6,750	6,750+3,450
	Motor Output x Number	kW	3.5 x 1	(3.5 + 3.75)
	Starting Method		Direct on Line	Direct on Line
Fan	Type		Propeller Fan	Propeller Fan
	Motor Output x Number	W	84*2	271*2
	Air Flow Rate(High)	cmm	70	180
		cfm	2471	6354
	Drive		Capacitor Run	Capacitor Run
Pipe Connections	Liquid Side	mm(inch)	12.7(1/2)	15.88(5/8)
	Gas Side	mm(inch)	19.05(3/4)	28.58(1 1/8)
Net Weight		kg(lbs)	125	300
Noise Level (Sound Press,1m, H/M/L)		dBA±3	57	60
Safety Device			High Pressure Switch, Fan Motor Safety Thermostat, Inverter Overload Protector, Over Current Relay, Fuse	
Control range of capacity		%	10~115	10~130
Refrigerant	Refrigerant Name		R407C	R407C
	Charge		3.5	10
	Control		L.E.V.	L.E.V.
Refrigerant Oil	Refrigerant Oil		DAPHNE FVC68D	DAPHNE FVC68D
	Charge Volume	CC	2,000	1,600 + 2,700
Power Supply		Ø,V,Hz	3, 380~415, 50	3, 380~415, 50
Standard Accessories			Installation Manual	

Notes:-

1. Capacities are based on the following conditions:
   - Cooling: - Indoor Temperature 27°C(80.6°F) DB /19°C(66.2°F) WB
     - Outdoor Temperature 35°C(95°F) DB /24°C(75.2°F) WB
     - Interconnecting Piping Length 7.5m
     - Level Difference of Zero.
   - Heating: - Indoor Temperature 20°C(68°F) DB / 15°C(59°F) WB
     - Outdoor Temperature 7°C(44.6°F) DB / 6°C(42.8°F) WB
     - Interconnecting Piping Length 7.5 m
     - Level Difference of Zero.
2. Capacities are Net Capacities.
3. Due to our policy of innovation some specifications may be changed without notification.
4. L.E.V. : Linear Expansion Valve

Conversion Formula
kcal/h = kW x 860
Btu/h = kW x 3414
cfm = m^3/min x 35.3

2. Function

Inverter Compressor	Scroll compressor that operates on 30~120Hz by inverter drive enables capacity control.
Oil separator	The oil separator is a device that collects the discharged oil from the Compressor. The collected oil is constantly recycled to the compressor via capillary tube.
High Pressure Sensor	High pressure sensor for sensing the operating status of the indoor by refrigerant pressure which senses discharge pressure.
Low Pressure Sensor	Low pressure sensor for sensing the operating status of the indoor by refrigerant pressure which senses suction pressure.
Hot gas Solenoid valve	Valve is open by low pressure safety control when pressure drops.
Liquid Injection Solenoid valve	Controls liquid injection in order to prevent overheating.
Linear Expansion Valve(LEV)	Linear expansion valve is controlled by micro controller when heating. When cooling linear expansion valve is fully opened.

Outdoor Unit

Power relay control

- If power is on, it will operate to charge capacitor on controller and power relay will operate after about 2~5sec.

Comp. Freq. control

- The final operating freq. of comp. is set to sum of operating indoor unit capacities.

Overheatng and over current Protection(IPM)

Bypass control • Hot gas and Liquid injection control by solenoid valve

V/F control

- It will be changed the drive voltage of comp. according to operating frequency.

Total current control (over current protection)

4 way valve control

- It is only operated in the heating operation mode except defrosting operation.

Outdoor fan motor control

- High speed/Low speed

Discharge pipe temperature control

LEV Control

Discharge Pressure control

Suction Pressure control

3. Operation detail

3.1 CRUN458S0

■ Compressor Control

(1) Compressor operation method

- In order to stop the compressor, decrease the frequency to 30Hz, and turn off.
- Rising speed of frequency : 1Hz/2seconds
  Decreasing speed of frequency: 1Hz/1second.

(2) Compressor Operation Step

Step	ICOF	Step	ICOF
0	0	16	60
1	30	17	62
2	32	18	64
3	34	19	66
4	36	20	68
5	38	21	70
6	40	22	75
7	42	23	80
8	44	24	85
9	46	25	90
10	48	26	95
11	50	27	100
12	52	28	105
13	54	29	110
14	56	30	115
15	58	31	120

- Maximum frequency for ICOFis limitted by the temperature of outdoor air.

***ICOF : Inverter Compressor Operation Frequency**

(3) Starting Method

According to table beside, change the step to base step(Step_base) for 3.5 minutes.

- Step 1 = 1 (30Hz)
- Step 2 = determined by pressure control
- Step 2 = (Step 1 + Step_base)/2
- Step 3 = (Step 2 + Step_base)/2
- Step 4 = (Step 3 + Step_base)/2
- Step 5 = (Step 4 + Step_base)/2

Consumed time	1 min	0.5min	0.5 min	0.5 min	0.5 min	0.5 min
Comp. Step	Step 1	Step 2	Step 3	Step 4	Step 5	Step_base

(4) Pressure Control(Stage B)

- In heating operation, ICOF is controlled for high pressure to reach base pressure(21bar).
  High_Pressure > 21bar → Step down
  High_Pressure < 19 bar → Step up
- In cooling operation, ICOF is controlled for low pressure to reach base pressure(6.6bar)
  Low_Pressure < 6.1bar → Step down
  Low_Pressure > 7.1bar → Step up

(5) Restart of Compressor

- In order to maintain equilibrium of pressure and prevention motor wire from generation of heat, after the compressor is turned off, for 3 minutes it should not be turned on.

■ Linear Expansion Valve(LEV) Control

(1) Control type

		LEV for Outdoor Unit	LEV for Indoor Unit		
			On state indoor unit	Off state Indoor unit	Thermo off state Indoor unit
Cooling	At starting	-	-	-	-
	Feed back control	-	Feed back control	-	-
Heating	At starting	-	-	-	-
	Feed back control	Freed back control	Feed back control	-	-
	Deicing	-	-	-	-

In case that main power is first turned on or in heating operation, there is no indoor unit turn on signal for 4 minutes after all of indoor units are turned off, then outdoor unit LEV is fully opened.

(2) Starting control for LEV

		1 min	0.5 min	0.5 min	0.5 min	0.5 min
Outdoor LEV	Cooling	Fully closed	←	←	←	←
	Heating	0.7 x Base pulse	0.8 x Base pulse	0.9 x Base pulse	Base pulse	←
On Indoor LEV	Cooling	0.7 x Base pulse	0.8 x Base pulse	0.9 x Base pulse	1.1 x Base pulse	Base pulse
	Heating	Base pulse	←	←	←	←
Off Indoor LEV	Cooling	Fully closed	←	←	←	←
	Heating	200 pulse	←	←	←	On/Off

■ Control of Outdoor Unit Fan

(1) Outdoor unit fan is controlled by motor which can be rotated high/low speed

(2) Steps of outdoor unit fan speed : 4 Steps

Step_Fan	Left	Right
4	High	High
3	Low	Low
2	High	X
1	Low	X
0	X	X

(3) Determination of fan speed(Step_Fan)

ΣQj	Step_Fan (Cooling)	ΣQj	Step_Fan (Heating)
7~24	3	7~24	3
25~60	4	25~60	4

ΣQj : Total capacity summation of indoor units (in Btu/h unit)

■ Control of Reversing Valve

1. Initial state: keep up OFF state
2. Cooling and Deicing operation: OFF
   Heating operation : ON
3. Change operation mode(Cooling and Heating): 3minutes restarting, reversing valve ON.
4. Compressor stop because of Thermo-OFF: keep up the present state.

■ Hot Gas Bypass Valve

(1) General control

1. At initial start of compressor: Turn on for 1 min.
2. After compressor OFF: Turn on for 10 minutes
   (This operation is resulted in equilibrium of pressure)

■ Deicing Operation

(1) The start condition of deicing operation

1. 10 minutes passed, since compressor starts

2. One of the two temperature of heat exchanger pipe in outdoor unit is continuously under the temperature of start condition of deicing operation for 20 seconds or more.

■ Oil Return Operation

(1) Conditions for oil return operation

1. Compressor on time (normal operation not full capacity operation) is 6 hours or more.
2. During operation, deicing operation is started or the load is changed to full capacity operation, the cumulative time is reset

(2) Process of oil return operation

1. Change the ICOF Step to 16.
2. In heating operation, oil return operation is performed in cooling mode by turning reversing valve off.
3. The method of handling reversing valve is the same that of same deicing operation

(3) Finishing oil return operation

1. After oil return operation carried out for 3 minutes, return to normal operation

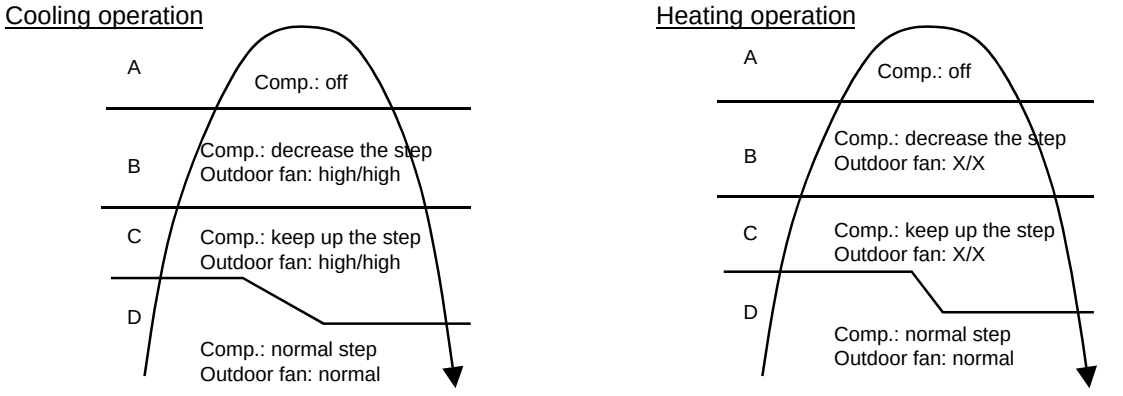
■ Safety Control

(1) Control to prevent high pressure

1. If the measured pressure(transformed absolute pressure)from high-pressure sensor satisfies the condition, take 1 minute periodic control like following graph.

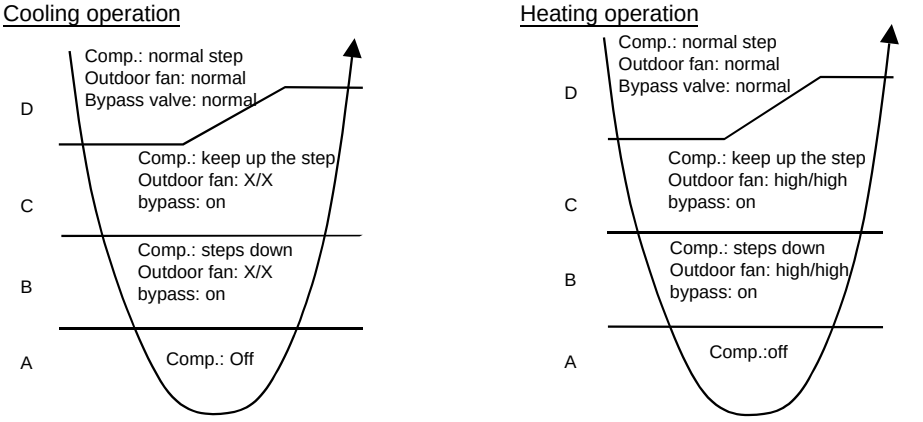
(2) Control to prevent low pressure

1. If the measured pressure(transformed absolute pressure)from low-pressure sensor satisfies the condition, take 1 minute periodic control like following graph.



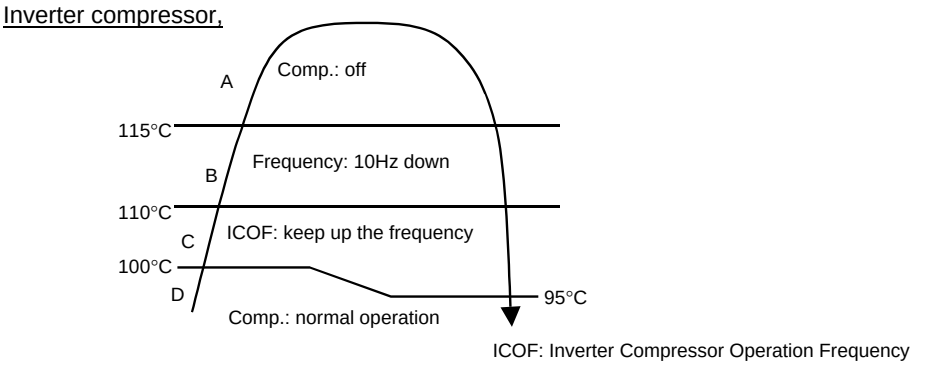
(2) Control to prevent low pressure

1. If the measured pressure(transformed absolute pressure)from low-pressure sensor satisfies the condition, take 1 minute periodic control like following graph.



(3) Control the discharge temperature

1. At the temperature of compressor discharge pipe >100°C, turn on the liquid injection valve.



(4) DC peak control

1. Criterion for DC peak : if the fault signal from IPM(Intelligent power moudule) is occurred continuously for 1.8ms, then it is judged that DC peak occurred.
2. As soon as DC peak occurs, inverter compressor is turned off immediately.
3. After inverter compressor turned off, 3minutes later if there is no DC peak signal, then restart compressor.

(5) CT(cirremt tramsfprmer) sensor fault error

■ **Detection for CT sensor fault**

Criterion for CT sensor fault(which is judged from operation current for each frequency)

	CT value
After Inverter Compressor Off	CT > 1.5A for 10 seconds

(6) Over upper limit voltage and below lowest limit voltage

If the voltage of system input power exceed the upper limit(415V) of rating voltage(380 ~ 415V) by 15% over(478V or more) or is below the lowest limit(380V) of rating voltage by 20%(304V or less) then the compressor is turned off, and restart 3 minutes later.

(7) Controls for error occurrence

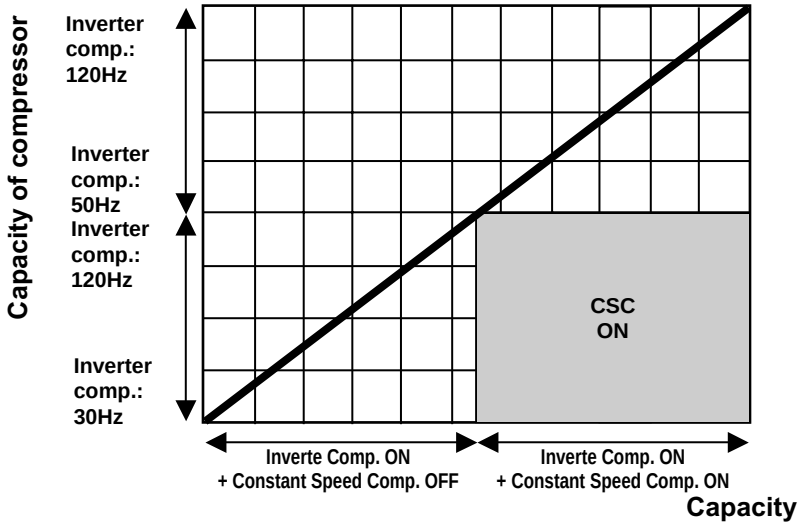
1. DC peak error
   - Restart 3 minutes later.
   - System down if the error occurs 3 or more times in an hour
2. CT sensor error
   - Restart 3 minutes later.
   - System down if the error occurs 3 or more times in an hour
3. Sensor error
   - During the error signal is on, the compressor can not be turned on
4. Transmission error
   - If the transmission with all of indoor unit is ceased, then compressor is turned off
   - If the transmission between inverter PC board and control PC board in outdoor unit, then all of the compressor is turned off.

3.2 CRUN1008T0

■ Compressor Control

(1) Compressor operation method

- Capacity control operation with the combination of Inverter compressor and constant speed compressor
- It is not allowed to operate constant speed compressor only.
- In over capacity range, rising of frequency is restrained because of the heat exchanger capacity limit.



(2) Compressor switching method(The method of constant speed compressor turn-on during Inverter compressor operation)

① After inverter compressor frequency is decreased to 40Hz, CSC turn on.

② Inverter compressor frequency is increased to corresponding step

(3) Compressor Operation Step

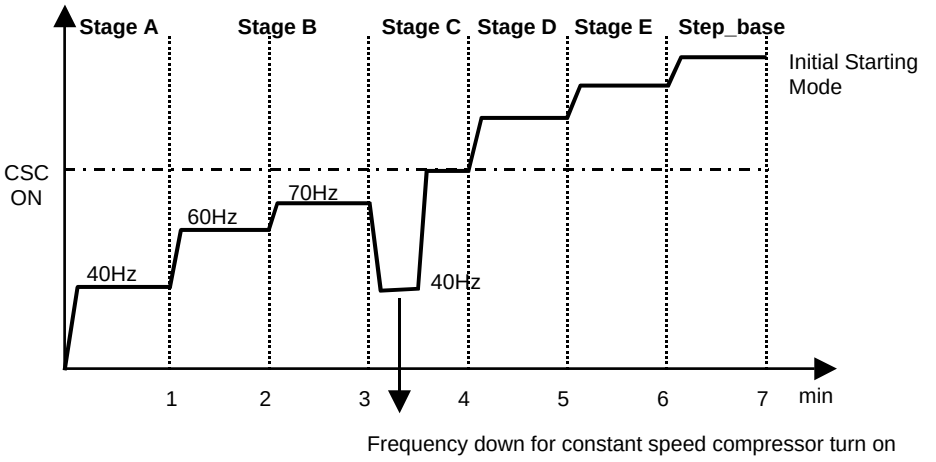
Step	Inverter Comp. Frequency	Constant Speed Comp.	Step	Inverter Comp. Frequency	Constant Speed Comp.	Step	Inverter Comp. Frequency	Constant Speed Comp.
0	0	off	16	60	off	32	50	on
1	30	off	17	62	off	33	55	on
2	32	off	18	64	off	34	60	on
3	34	off	19	66	off	35	65	on
4	36	off	20	68	off	36	70	on
5	38	off	21	70	off	37	75	on
6	40	off	22	75	off	38	80	on
7	42	off	23	80	off	39	85	on
8	44	off	24	85	off	40	90	on
9	46	off	25	90	off	41	95	on
10	48	off	26	95	off	42	100	on
11	50	off	27	100	off	43	105	on
12	52	off	28	105	off	44	110	on
13	54	off	29	110	off	45	115	on
14	56	off	30	115	off	46	120	on
15	58	off	31	120	off			

(4) starting Method

- Total 7 minutes consumed for starting operation
- After 7 minutes, the compressor operates at target frequency step

• Stage A = Step 6(40Hz + Off)
• Stage B = determined by pressure control
• Stage C = (Stage B + Step_base)/2
• Stage D = (Stage C + Step_base)/2
• Stage E = (Stage D + Step_base)/2

Consumed time	1 min	2 min	1 min	1 min	1 min	1 min
Comp. Stage	Stage A	Stage B	Stage C	Stage D	Stage E	Step_base



(5) Pressure Control(Stage B)

- In heating operation, ICOF is controlled for high pressure to reach base pressure(21bar).
- After stage A finished, ICOF is stepped up by 1.

High_Pressure > 21bar → Step down
High_Pressure < 19 bar → Step up

- In cooling operation, ICOF is controlled for low pressure to reach base pressure(6.6bar)
- After stage A finished, ICOF is stepped up by 1.

Low_Pressure < 6.1bar → Step down
Low_Pressure > 7.1bar → Step up

(6) Compressor control at power input

① For 3 minutes after main power input, crank case heater is turned on, though ON signal is inputted from indoor unit, compressor is not operated for 3 minutes.
② After 3 minutes later from main power input, the compressor can be operated in case that following conditions are satisfied.
i) If outdoor air temperature > 5°C, then crank case heater is OFF and the compressor can be started
ii) If outdoor air temperature < 5°C, then crank case heater is ON continuously and 5 hours later the compressor can be started.
③ For the operation of ②, though forced operation signal from indoor unit is in, those are all ignored and displays 'crank case heater operation' at indoor unit.

■ Linear Expansion Valve(LEV) Control

(1) Control type

		LEV for Outdoor Unit	LEV for Indoor Unit		
			On state indoor unit	Off state Indoor unit	Thermo off state Indoor unit
Cooling	At starting	Fully open	Base Pulse	Fully Closed	Fully Closed
	Feed back control	Fully open	Feed back control	Fully Closed	Fully Closed
Heating	At starting	Base Pulse	Base Pulse	open	Fully Closed
	Feed back control	Feed back control	Feed back control	open	Fully Closed
	Deicing	Deicing	Fully Open	Fully Open	Fully Open

■ Control of Outdoor Unit Fan

(1) After compressor start, the rotation speed of two fans is High/High for 1 minute, and then step control which is considered the total capacity and indoor air temperature is executed.

(2) Steps of outdoor unit fan speed : 4 Steps

Step_Fan	Left	Right
4	High	High
3	Low	Low
2	High	X
1	Low	X
0	X	X

(3) Determination of fan speed(Step_Fan)

ΣQj	Step_Fan (Cooling)	ΣQj	Step_Fan (Heating)
7~12	3	7~12	3
13~24	3	13~24	3
25~50	4	25~50	4
51~109	4	51~109	4

ΣQj : Total capacity summation of indoor units (in Btu/h unit)

■ Control of Reversing Valve

1. Initial state: keep up OFF state
2. Cooling and Deicing operation: OFF
   Heating operation : ON
3. Change operation mode(Cooling → Heating): 3minutes restarting, reversing valve ON.
4. Compressor stop because of Thermo-OFF: keep up the present state.

■ Hot Gas Bypass Valve

(1) General control

1. At initial start of compressor: Turn on for 1 min. (Inverter comp. frequency :40Hz + Constant speed comp.: OFF)
2. After 5 seconds from compressor OFF: Turn on for 10 minutes
   (This operation is resulted in equilibrium of pressure)

■ Deicing Operation

(1) The start condition of deicing operation

1. 10 minutes passed, since compressor starts
2. One of the two TOHEXP is continuously under the temperature of start condition of deicing operation for 20 seconds or more.

■ Oil Return Operation

(1) Conditions for oil return operation

1. Compressor on time (normal operation) is 6 hours or more.
2. After deicing operation or oil return operation is finished, the cumulative time is reset

(2) Process of oil return operation

1. Change the Step to 35 (55Hz + Constant speed comp.: On).
2. In heating operation, oil return operation is performed in cooling mode by turning reversing valve off.
3. The method of handling reversing valve is the same that of same deicing operation

(3) Finishing oil return operation

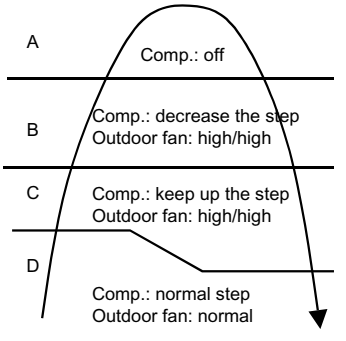
1. After oil return operation carried out for 3 minutes, return to normal operation.

■ Safety Control

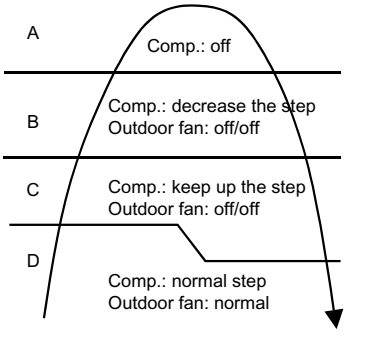
(1) Control to prevent high pressure

1. If the measured pressure(transformed absolute pressure)from high-pressure sensor satisfies the condition, take 1 minute periodic control like following graph.

Cooling operation



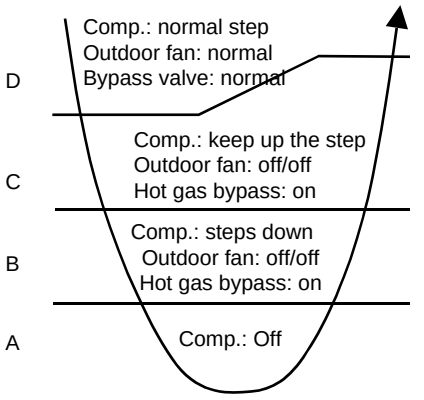
Heating operation



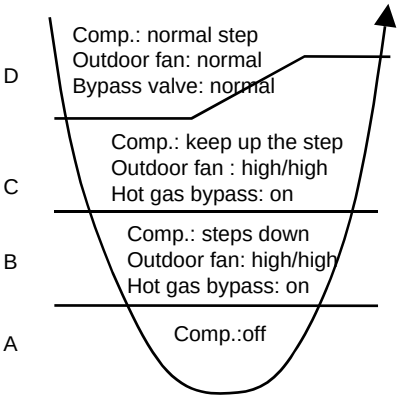
(2) Control to prevent low pressure

1. If the measured pressure(transformed absolute pressure)from low-pressure sensor satisfies the condition, take 1 minute periodic control like following graph.

Cooling operation



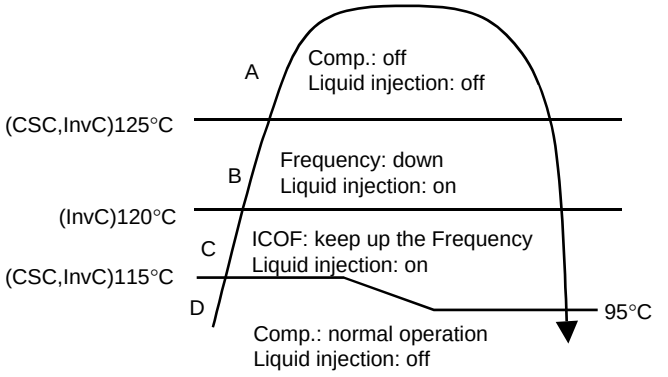
Heating operation



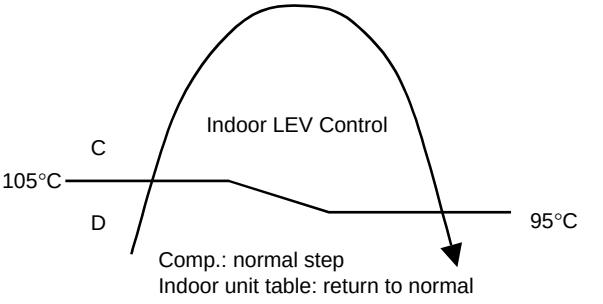
(3) Control the discharge temperature

1. At the temperature of compressor discharge pipe >115°C, turn on the liquid injection valve.
2. With the control of discharge temperature, the control of LEV in indoor unit carried out like following graph.

Inverter compressor,
Constant speed compressor
(the existing control)



Inverter compressor
(Indoor unit emergency control)



CSC: Constant Speed Compressor
InvC: Inverter Compressor
ICOF: Inverter Compressor Operation Frequency

(4) DC peak control

1. Criterion for DC peak : if the fault signal from IPM Intelligent (Power Module) is occurred continuously for 1.8ms, then it is judged that DC peak occurred.
2. After inverter compressor turned off, 3minutes later if there is no DC peak signal, then restart compressor.

(5) CT(current transformer) sensor fault error

Detection for CT sensor fault

Criterion for CT sensor fault(which is judged from operation current for each frequency)

	CT value
After Inverter Compressor Off	CT > 1.5A for 10 seconds

(6) Over upper limit voltage and below lowest limit voltage

If the voltage of system input power exceed the upper limit(415V) of rating voltage(380 ~ 415V) by 15% over(478V or more) or is below the lowest limit(380V) of rating voltage by 20%(304V or less) then the compressor is turned off, and restart 3 minutes later.

(7) Controls for error occurrence

1. DC peak error
- Restart 3 minutes later.
- System down if the error occurs 3 or more times in an hour

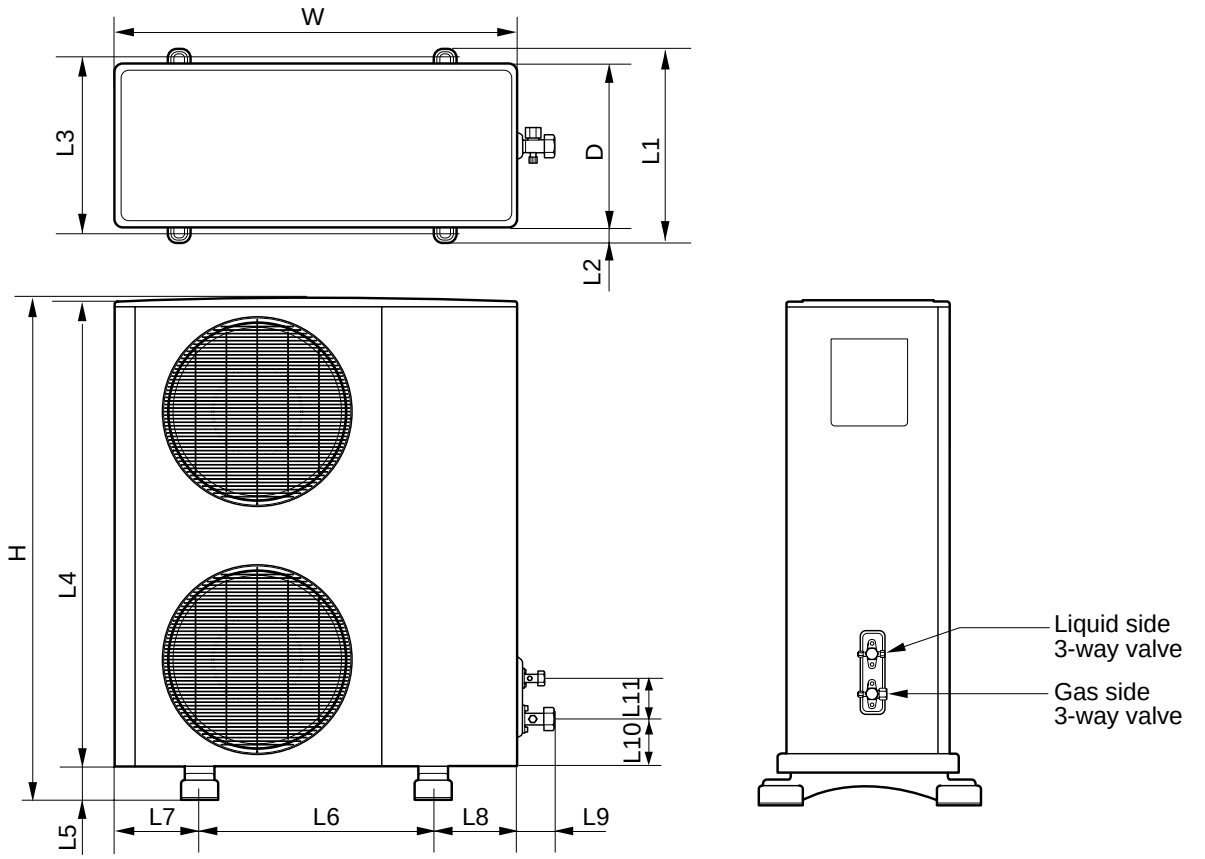
2. CT sensor error
- Restart 3 minutes later.
- System down if the error occurs 3 or more times in an hour- Counter reset if the error

3. Sensor error
- During the error signal is on, the compressor can not be turned on

4. Transmission error
- If the transmission with all of indoor unit is ceased, then compressor is turned off
- If the transmission between inverter PC board and control PC board in outdoor unit, then all of the compressor is turned off.

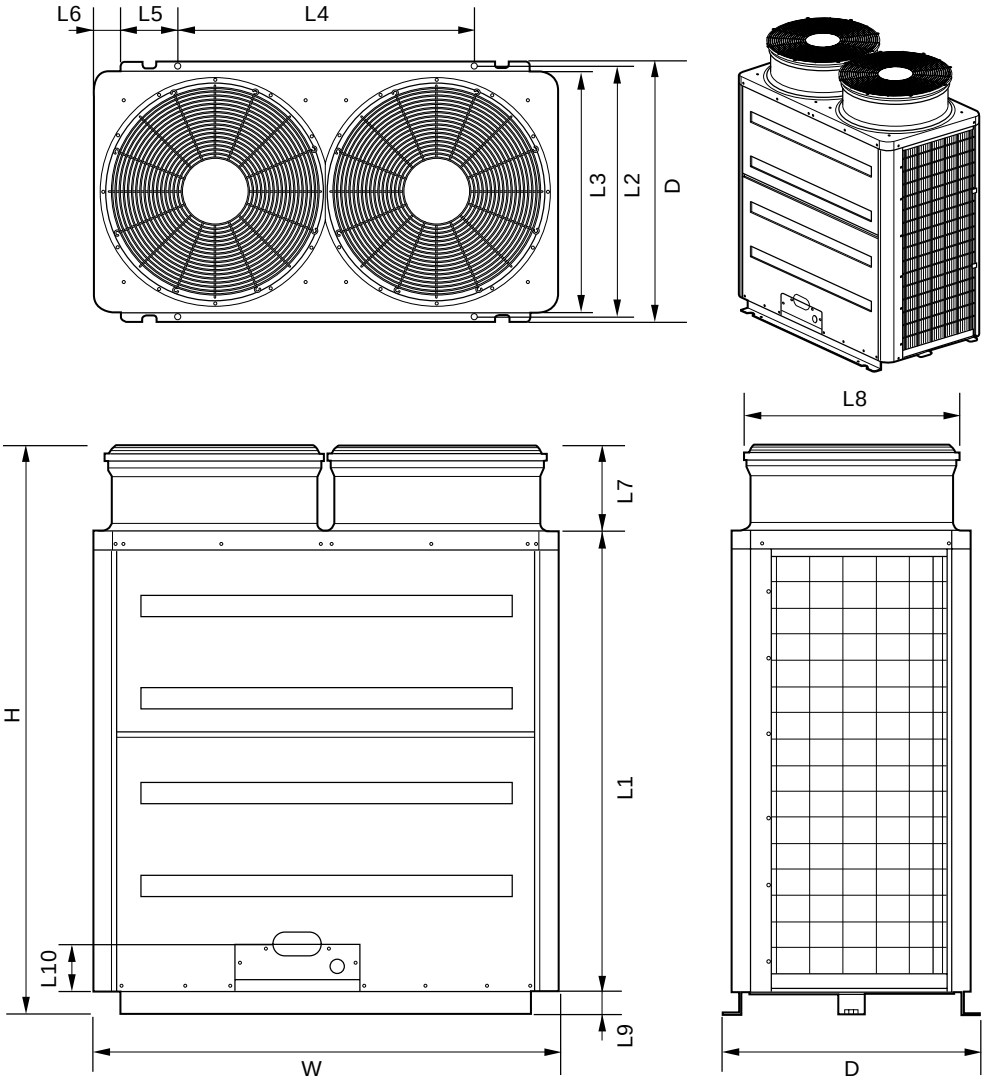
4. Dimensional Drawings

CRUN158S0



Dimension \ Model		CRUN458S0
W	mm	900
H	mm	1225
D	mm	370
L1	mm	460
L2	mm	45
L3	mm	410
L4	mm	1135
L5	mm	90
L6	mm	550
L7	mm	175
L8	mm	175
L9	mm	112
L10	mm	120
L11	mm	83

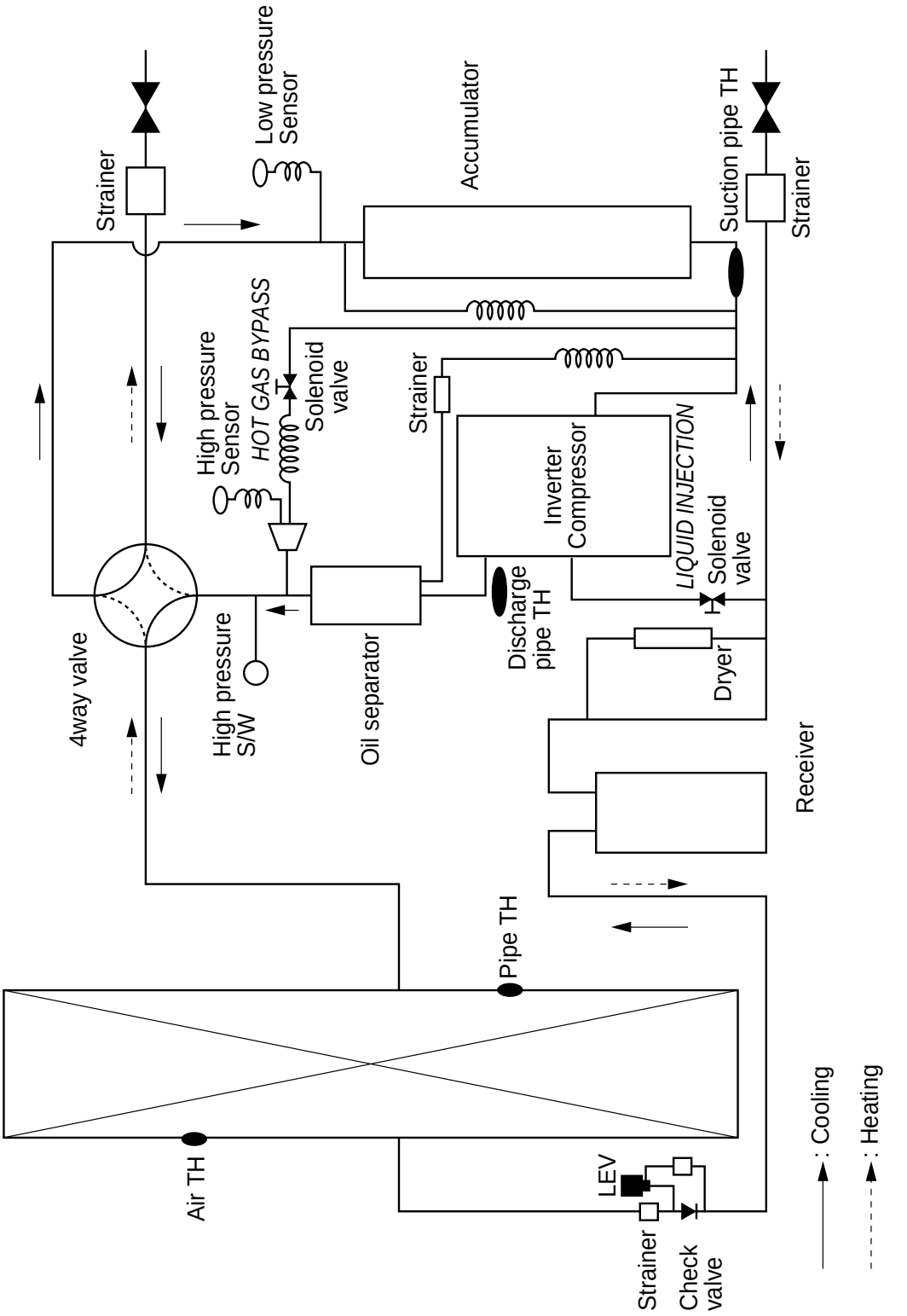
CRUN1008T0



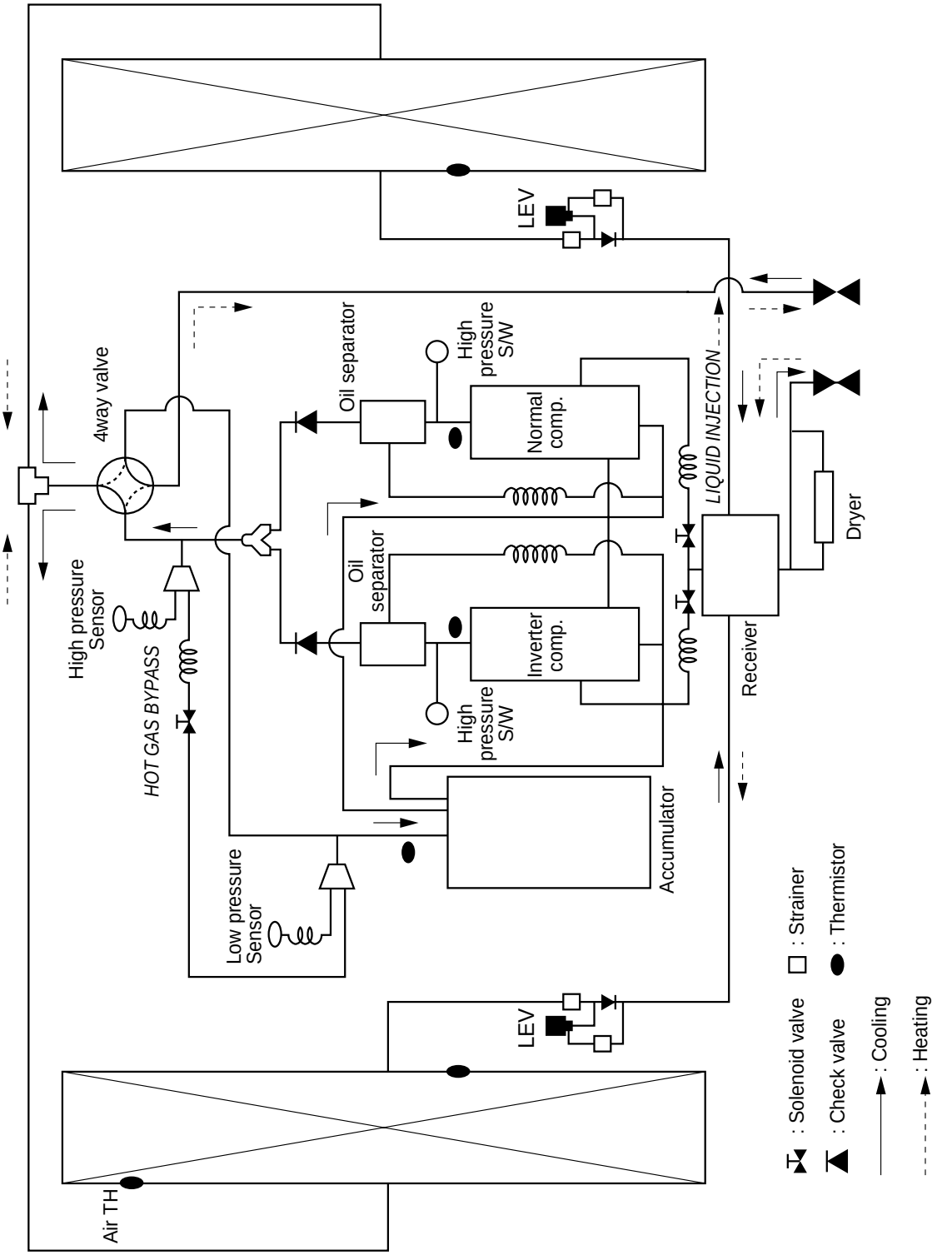
Dimension / Model No.		CRUN1008T0
W	mm	1,246
H	mm	1,519
D	mm	700
L1	mm	1,237
L2	mm	677
L3	mm	650
L4	mm	797
L5	mm	150
L6	mm	74
L7	mm	222
L8	mm	585
L9	mm	60
L10	mm	125

5. Refrigerant Cycle Diagram

CRUN458S0

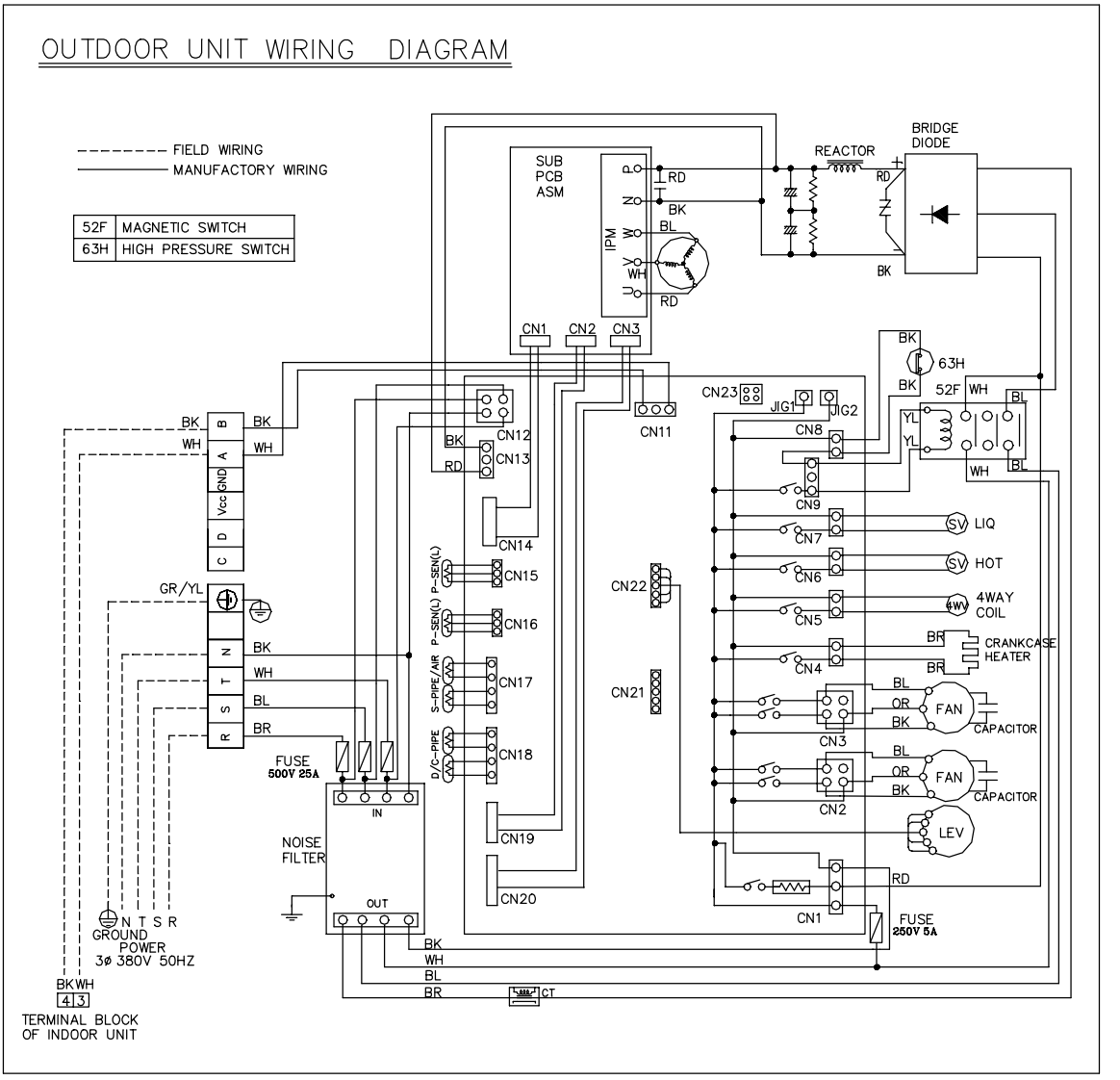


CRUN1008T0


LEV
4way valve
Oil separator
High pressure S/W
Normal comp.
LIQUID INJECTION
Dryer
High pressure Sensor
HOT GAS BYPASS
Oil separator
Inverter comp.
Receiver
High pressure S/W
Accumulator
Low pressure Sensor
LEV
Air TH
: Solenoid valve
: Check valve
: Strainer
: Thermistor
: Cooling
: Heating

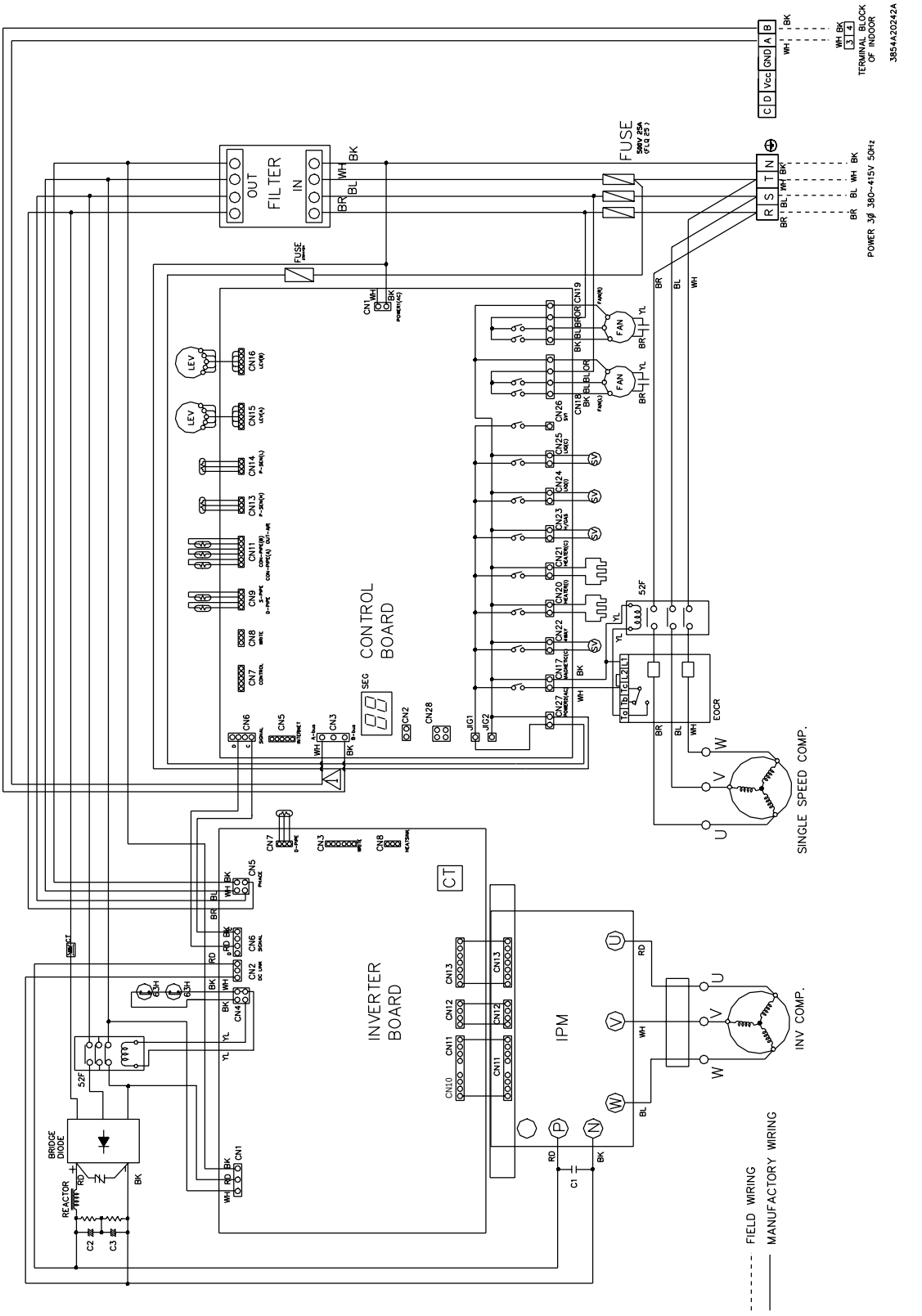
6. Wiring diagrams

CRUN458S0



Connector Number	SPEC	Color	Description	Connector Number	SPEC	Color	Description
CN1	POWER	NT	AC POWER SUPPLY	CN13	DC-LINK	RD	DC LINK VOLTAGE DETECT
CN2	FAN(L)	BL	FAN MOTOR LOW SIDE	CN14	IPM	WH	IPM CONTROL SIGNAL
CN3	FAN(H)	RD	FAN MOTOR HIGH SIDE	CN15	P-SEN(L)	BL	LOW PRESSURE SENSOR
CN4	HEAT	YL	COMPRESSOR CRANK CASE HEATER	CN16	P-SEN(H)	RD	HIGH PRESSURE SENSOR
CN5	4WAY	BL	4WAY REVERSING VALVE	CN17	S-PIPE/AIR	BL	SUCTION PIPE SENSOR/AIR SENSOR
CN6	H/GAS	GR	H/GAS VALVE	CN18	D/C-PIPE	RD	DISCHARGE/CONDENSOR SENSOR
CN7	LIQ	RD	LIQUID INJECTION VALVE	CN19	IPM-POW2	WH	IPM DC POWER 2
CN8	H/P	WH	HIGH PRESSURE SWITCH	CN20	IPM-POW1	WH	IPM DC POWER 1
CN9	MAGNETIC	BL	MAGNETIC SWITCH	CN21	CENTROL	BL	INTERNET & CENTRAL CONTROL
JIG1, 2	JIG	WH	JIG AC POWER	CN22	LEV	RD	LINEAR EXPANSION VALVE
CN11	TO-INDOOR	BL	TRANSMISSION WITH INDOOR UNIT	CN23	JEG	NT	JIG SIGNAL
CN12	PHASE	NT	3 PHASE 4 LINE CHECK				

CRUN1008T0


CONTROL BOARD
INVERTER BOARD
IPM
CT
FUSE
OUT
FILTER
IN
TERMINAL BLOCK OF INDOOR
POWER 3ϕ 380~415V 50Hz
SINGLE SPEED COMP.
INV COMP.
BRIDGE DIODE
REACTOR
FIELD WIRING
MANUFACTORY WIRING

Control board

Connector Number	SPEC	Color	Description
CN1	POWER 1(AC)	NT	AC POWER 1
CN2		YL	NOT USE
CN3	TO-INDOOR	WH	TRANSMISSION WITH INDOOR
JIG1, 2	JIG	WH	JIG POWER
CN5		WH	NOT USE
CN6	SIGNAL	RD	TRANSMISSION WITH INVERTER BOARD
CN7	CENTRAL CONTROL	BL	INTERNET CENTRAL CONTROL
CN8		WH	NOT USE
CN9	D-PIPE/S-PIPE(B)	BL	DISCHARGE/SUCTION PIPE TERMINALS
CN11	CON-PIPE(A) CON-PIPE(B) OUT-AIR	WH	CONDENSER PIPE THERMISTOR OUTDOOR AIR THERMISTOR
CN13	P-SEN(H)	RD	HIGH PRESSURE SENSOR
CN14	P-SEN(L)	BL	LOW PRESSURE SENSOR
CN15	LEV(A)	RD	LINEAR EXPANSION VALVE(A)

Connector Number	SPEC	Color	Description
CN16	LEV(B)	RD	LINEAR EXPANSION VALVE(B)
CN17	MAGNETIC	BL	MAGNETIC SWITCH
CN18	FAN(L)	BL	FAN MOTOR (LEFT)
CN19	FAN(R)	RD	FAN MOTOR (RIGHT)
CN20	HEATER(I)	YL	INTERNET COMP. CRANK HEATER
CN21	HEATER(C)	WH	CONSTANT COMP. CRANK HEATER
CN22	4WAY	BL	4WAY REVERSING VALVE
CN23	H/GAS	GR	HOT GAS VALVE
CN24	LIQ(I)	RD	INVERTER LIQUID INJECTION VALVE
CN25	LIQ(C)	RD	LIQUID INJECTION VALVE
CN27	POWER2(AC)	NT	INPUT POWER AC
CN28	JIG	NT	JIG SIGNAL

Inverter board

Connector Number	SPEC	Color	Description
CN1	POWER	YL	AC POWER
CN2	DC-LINK	RD	DC LINK VOLTAGE DETECT
CN3	WRITE	BL	ON BOARD WRITING
CN4	H/P, M	GRAY	HIGH PRESSURE SWITCH MAGNETIC SWITCH
CN5	PHASE	NT	3 PHASE DETECT
CN6	SIGNAL	RD	TRANSMISSION WITH CONTROL BOARD
CN7	D-PIPE	WH	DISCHARGE PIPE THERMISTOR
CN10,11,12	IPM	WH	PWM SIGNAL
CN13	IPM	WH	PWM CONTROL POWER

Color

WH: white

RD: red

BL: blue

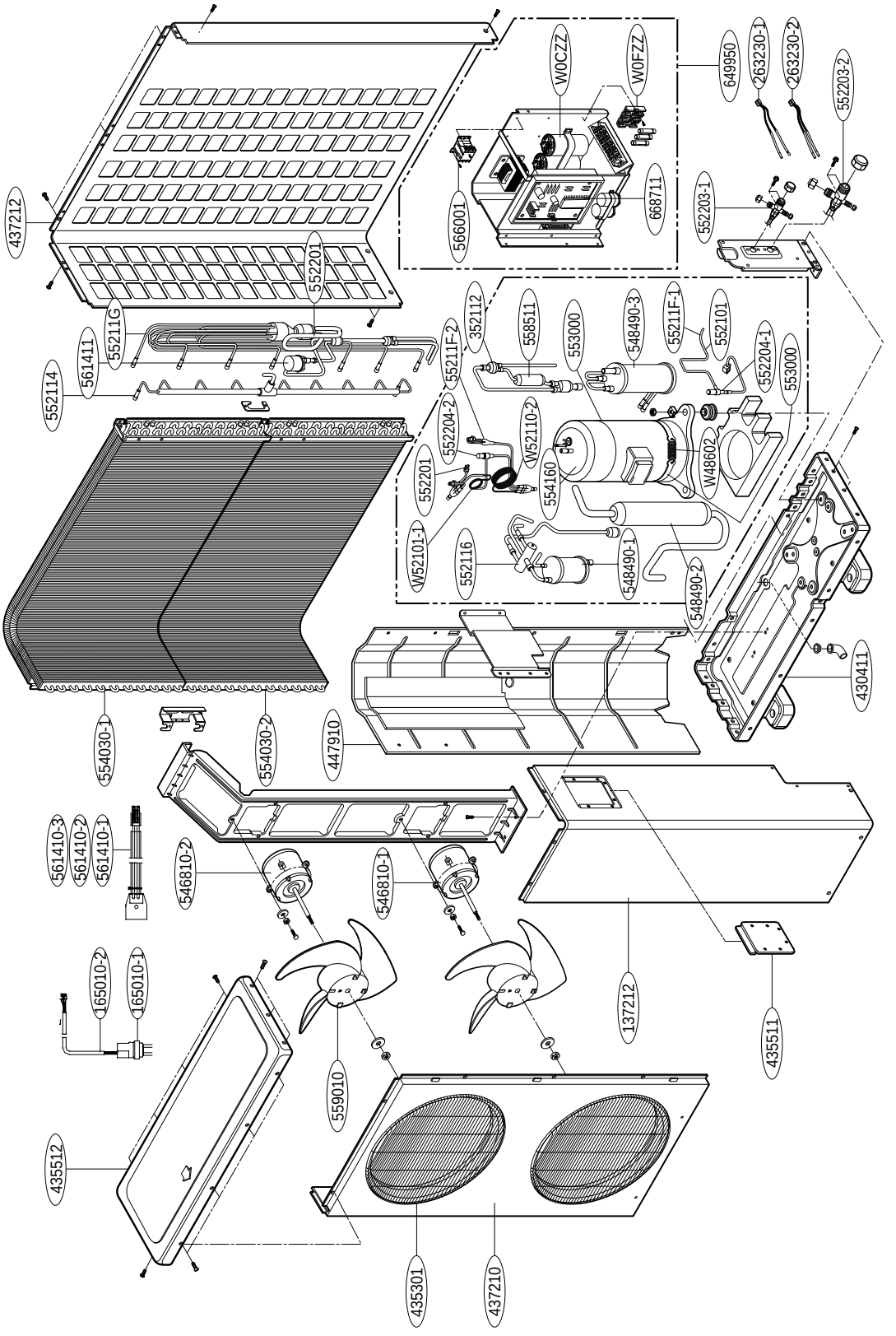
YL: yellow

GR: green

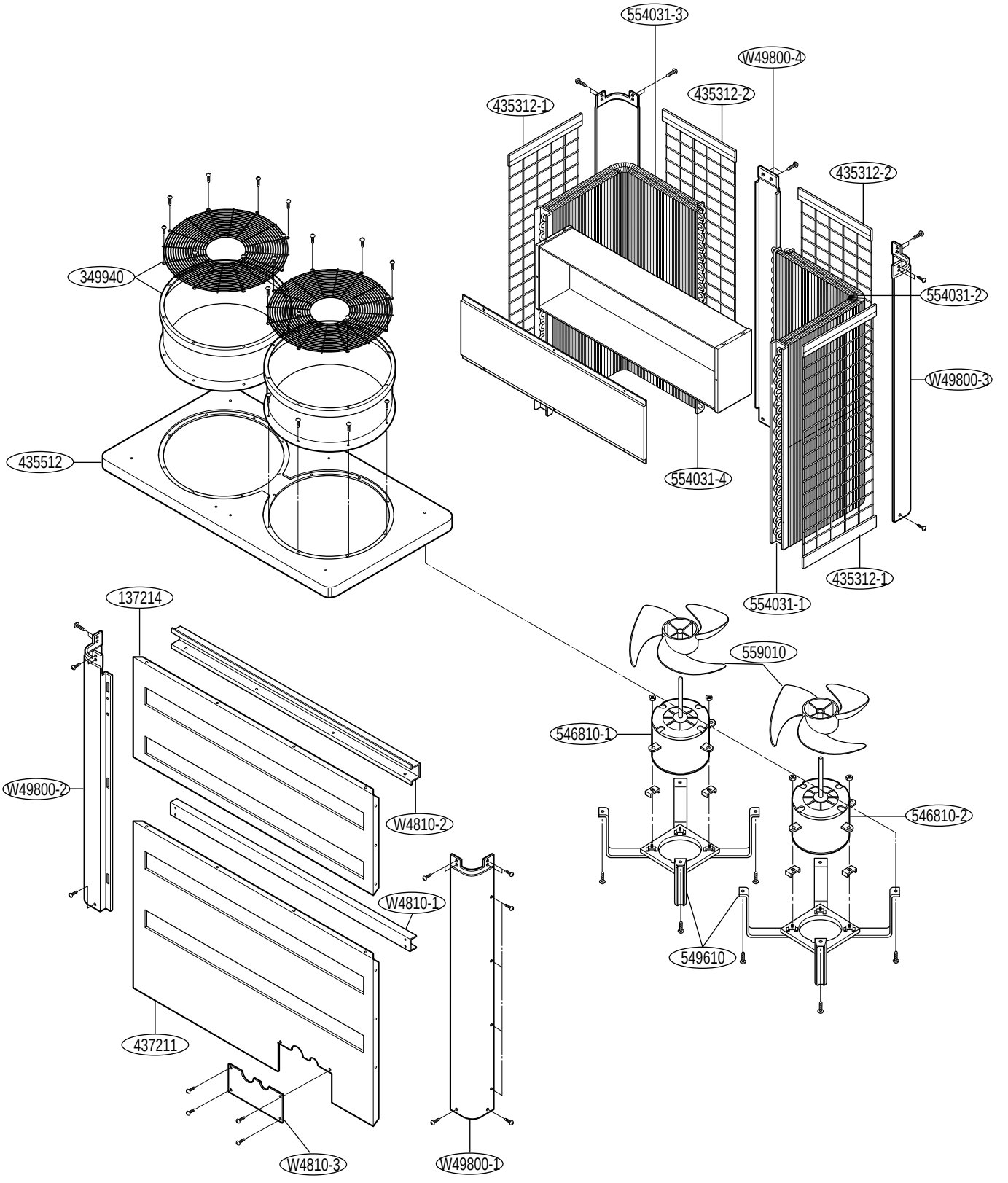
NT: natural

7. Exploded View

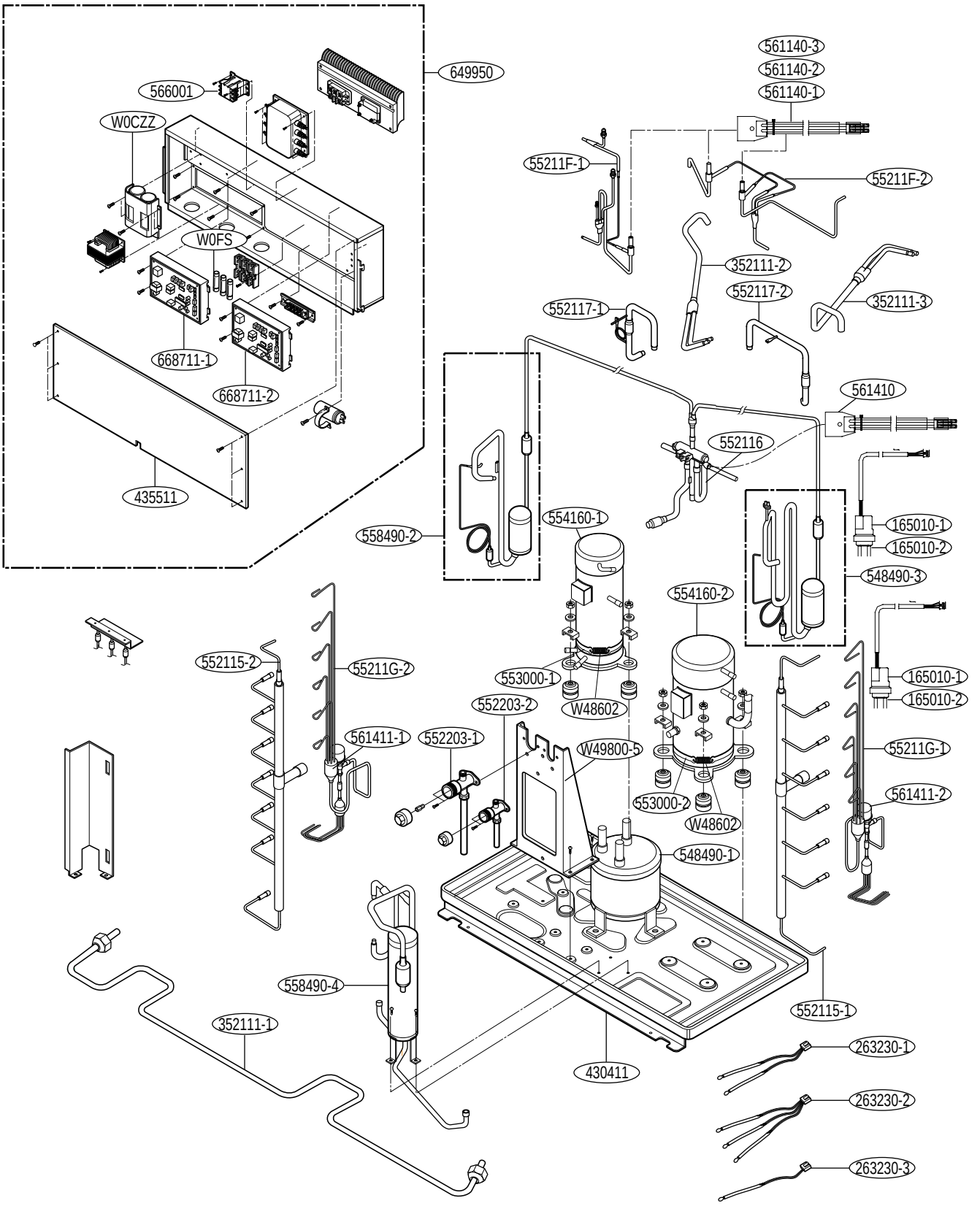
CRUN458S0



CRUN1008T0


554031-3
W49800-4
435312-1
435312-2
435312-2
554031-2
W49800-3
349940
435512
554031-4
435312-1
554031-1
137214
559010
546810-1
W49800-2
W4810-2
546810-2
W4810-1
549610
437211
W4810-3
W49800-1

CRUN1008T0


649950
566001
W0CZZ
W0FS
668711-1
668711-2
435511
561140-3
561140-2
561140-1
55211F-1
55211F-2
352111-2
552117-2
352111-3
552117-1
561410
552116
558490-2
554160-1
165010-1
165010-2
548490-3
554160-2
552115-2
55211G-2
553000-1
W48602
552203-2
561411-1
552203-1
W49800-5
553000-2
W48602
548490-1
55211G-1
561411-2
558490-4
352111-1
552115-1
263230-1
263230-2
263230-3
430411

8. Replacement parts list

CRUN458S0

LOCATION NO.	DESCRIPTION	PART NO.	REMARK
		CRUN458S0	
548490-1	ACCUMULATOR ASSEMBLY(MECH)	4849A10014A	R
548490-2	ACCUMULATOR ASSEMBLY(MECH)	4849A10015A	R
548490-3	ACCUMULATOR ASSEMBLY(MECH)	4849A10018A	R
447910	BARRIER ASSEMBLY, OUTDOOR	4791A20012B	R
430411	BASE ASSEMBLY, WELD(OUTDOOR)	3041A20047D	R
561411	COIL ASSEMBLY, EXPANSION	6141A20009A	R
561410-1	COIL ASSEMBLY, REVERSING VALVE(H/GAS)	6421AR3209Y	R
561410-2	COIL ASSEMBLY, REVERSING VALVE(LIQ(I))	6421AR3209Z	R
561410-3	COIL ASSEMBLY, REVERSING VALVE	6141AR3509Z	R
554160	COMPRESSOR	5416A20030A	R
649950	CONTROL BOX ASSMBLY, OUTDOOR	4995A10073A	R
668711	PWB(PCB) ASSEMBLY, MAIN(OUTDOOR)	6871A20247A	R
W0CZZ	CAPACITOR,DRAWING	0CZZA90001E	R
566001	SWITCH,MAGNET	6600B000048	R
W0FZZ	FUSE,DRAWING	0FZZA90001A	R
435511	COVER ASSY,CONTROL(OUTDOOR)	3551A30014X	R
435512	COVER ASSY,TOP(OUTDOOR)	3550AP1213B	R
558511	DRIER ASSY	5851A20002A	R
559010	FAN ASSY,PROPELLER	1A00195B	R
553000	HEATER,SUMP	2A00093W	R
W48602	CLAMP,SPRING	4H01930A	R
546810-1	MOTOR ASSY,OUTDOOR(UNDER)	4681A20013W	R
546810-2	MOTOR ASSY,OUTDOOR(UPPER)	4681A20013Y	R
437210	PANEL ASSY,FRONT	3720AP1212B	R
435301	GRILLE,DISCHARGE	3530AP1225D	R
437212	PANEL ASSY,REAR	3720AP1202C	R
137213	PANEL,SIDE	3720AP1215B	R
263230-1	THERMISTOR ASSY(S-PIPE/AIR)	6323A20011A	R
263230-2	THERMISTOR ASSY(D-PIPE/COND.)	6323A20011B	R
554030-1	CONDENSER ASSY,BENT	5403A20148C	R
554030-2	CONDENSER ASSY,BENT	5403A20148F	R
552114	TUBE ASSY,MENIFOLD(OUTDOOR)	5211A10285D	R
55211G	TUBE ASSY,EXPANSION	5211A10297A	R
552116	TUBE ASSY,REVERSING	5211A20629A	R
55211F-1	TUBE ASSY,SOLENOID	5211A10308A	R
55211F-2	TUBE ASSY,SOLENOID	5211A10307A	R
352112	TUBE ASSY,COUPLING	5211A10284A	R
165010-1	SENSOR ASSY(LOW)	6501A20002A	R
165010-2	SENSOR ASSY(HIGH)	6501A20003A	R
552203-1	VALVE,SERVICE	2H01890Q	R
552203-2	VALVE,SERVICE	2A00499C	R

CRUN1008T0

LOCATION NO.	DESCRIPTION	PART NO.	REMARK
		CRUN1008T0	
435511	COVER(CONTROL BOX)	3550A20146A	R
165010-1	SENSOR ASSEMBLY(HIGH)	6501A20004A	R
165010-2	SENSOR ASSEMBLY(LOW)	6501A20004B	R
263230-1	THERMISTOR ASSEMBLY(D-PIPE/S-PIPE)	6323A20011D	R
263230-2	THERMISTOR ASSEMBLY(CON(A)/CON(B)/AIR)	6323A20009A	R
263230-3	THERMISTOR ASSEMBLY(INVERTER D-PIPE)	6323A20001E	R
349940	ORIFICE ASSEMBLY	4949A10005A	R
352111-1	TUBE ASSEMBLY,CONNECTOR	5211A20744A	R
352111-2	TUBE ASSEMBLY,CONNECTOR	5211A20701A	R
352111-3	TUBE ASSEMBLY,CONNECTOR	5211A20702A	R
430411	BASE ASSEMBLY,WELD[OUTDOOR]	3041AP2606Z	R
435312-1	GRILLE ASSEMBLY,REAR(OUTDOOR)	3531A10197B	R
435312-2	GRILLE ASSEMBLY,REAR(OUTDOOR)	3531A10197D	R
435512	COVER	3550A10066C	R
437211	PANEL ASSEMBLY,FRONT(OUTDOOR)	3721A10085A	R
137214	PANEL ASSEMBLY,UPPER	3720A10075C	R
546810-1	MOTOR ASSEMBLY,OUTDOOR(L)	4681A10014A	R
546810-2	MOTOR ASSEMBLY,OUTDOOR(R)	4681A10014B	R
548490-1	ACCUMULATOR ASSEMBLY(MECH)	4849A10038B	R
548490-2	ACCUMULATOR ASSEMBLY(MECH)	4849A10013A	R
548490-3	ACCUMULATOR ASSEMBLY(MECH)	4849A10016A	R
548490-4	ACCUMULATOR ASSEMBLY(MECH)	4849A10020A	R
549610	MOUNT ASSEMBLY,MOTOR(OUTDOOR)	4961A10005A	R
552115-1	TUBE ASSEMBLY,MENIFOLD(OUTDOOR) (R)	5211A20554B	R
552115-2	TUBE ASSEMBLY,MENIFOLD(OUTDOOR) (L)	5211A20554A	R
552116	TUBE ASSEMBLY,REVERSING	5211A20585B	R
552117-1	TUBE ASSEMBLY,SUCTION(OUTDOOR)	5211A20760A	R
552117-2	TUBE ASSEMBLY,SUCTION(OUTDOOR)	5211A10315A	R
55211F-1	TUBE ASSEMBLY,SOLENOIDE	5211A10286B	R
55211F-2	TUBE ASSEMBLY,SOLENOIDE	5211A10281A	R
55211G-1	TUBE ASSEMBLY,EXPANSION	5211A10294A	R
55211G-2	TUBE ASSEMBLY,EXPANSION	5211A10283A	R
552203-1	VALVE,SERVICE	2A00469J	R
552203-2	VALVE,SERVICE	2A00468L	R
553000-1	HEATER,SUMP(I)	2A00093U	R
553000-2	HEATER,SUMP(C)	2A00093V	R
554031-1	CONDENSER ASSEMBLY,BENT	5403A20085J	R
554031-2	CONDENSER ASSEMBLY,BENT	5403A20085K	R
554031-3	CONDENSER ASSEMBLY,BENT	5403A20085L	R
554031-4	CONDENSER ASSEMBLY,BENT	5403A20085M	R
554160-1	COMPRESSOR	5416A20030B	R
554160-2	COMPRESSOR	5416A20030C	R

CRUN1008T0

LOCATION NO.	DESCRIPTION	PART NO.	REMARK
		CRUN1008T0	
559910	FAN ASSEMBLY,PROPELLER	5901A10029A	R
561410-1	COIL ASSEMBLY,SOLENOID(LIQ(I))	6141A10001A	R
561410-2	COIL ASSEMBLY,SOLENOID(LIQ(C))	6141A10001B	R
561410-3	COIL ASSEMBLY,SOLENOID(H/GAS)	6141A10001C	R
561410	COIL ASSEMBLY,REVERSING VALVE	6141A20010A	R
561411-1	COIL ASSEMBLY,EXPANSION	6141A20009C	R
561411-2	COIL ASSEMBLY,EXPANSION	6141A20009E	R
566001	SWITCH,MAGNET	2A01031H	R
649950	CONTROL BOX ASSEMBLY,OUTDOOR	4995A10069A	R
668711-1	PWB(PCB) ASSEMBLY,MAIN(OUTDOOR)	6871A10076A	R
668711-2	PWB(PCB) ASSEMBLY,MAIN(OUTDOOR)	6871A10075A	R
W4810-1	BRACKET ASSEMBLY	4811A20028A	R
W4810-2	BRACKET	4810A20114A	R
W4810-3	BRACKET	4810A20116B	R
W49800-1	SUPPORTER	4980A20053B	R
W49800-2	SUPPORTER	4980A20052B	R
W49800-3	SUPPORTER	4980A20054B	R
W49800-4	SUPPORTER	4980A20055B	R
W49800-5	SUPPORTER	4980AP2621C	R
WOCZZ	CAPACITOR,DRAWING	0CZZA90001E	R
WOFS	FUSE,DRAWING	0FZZA90001A	R
W48602	CLAMP,SPRING	4H01930A	R

Control Devices and Functions

Control Device and Functions

1. Control Devices and Function

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2. Deluxe Central Control

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3.4 Optional operation.....207

1. Control Devices and Function

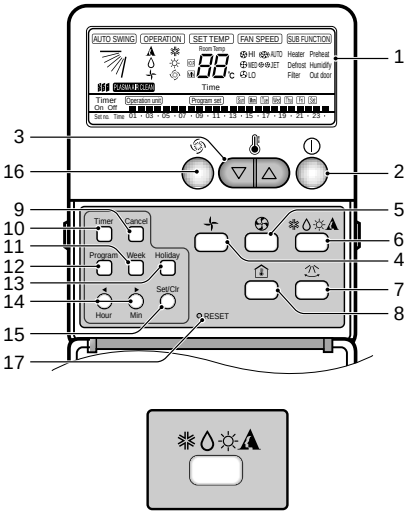
1.1 Wired Remote Control

1.1.1 Appearance and Functions

Appearance

Ceiling Mounted Cassette Type:
CRNN -TC/TD/TE

Convertible Type:
CRNN -TB

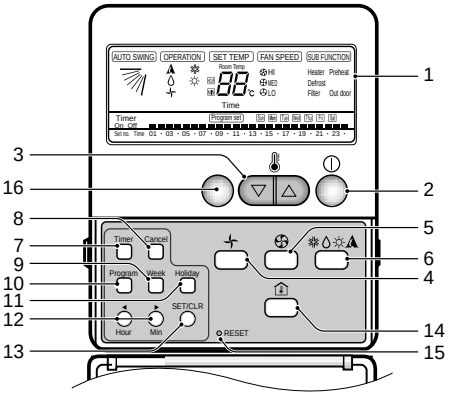


Functions (Button Descriptions)

No.	Name	Function
1	Operation display	Displays the operation conditions.
2	On/Off	Operation starts when this button is pressed, and stops when the button is pressed again.
3	Set Temperature	Used to set the temperature when the desired temperature is obtained.
4	FAN Operation	Used to circulate room air without cooling or heating.
5	Fan Speed	Used to set the desired fan speed
6	Operation Mode Selection	Used to select the operation mode.
7	Auto Swing	Used to swing up and down.
8	Room Temperature Checking	Used to check the room temperature.
9	Timer Cancel	Used to cancel the timer.
10	Timer Set	Used to set the timer when the desired time is obtained.
11	Week	Used to set a day of the week
12	Program	Used to set the weekly timer.
13	Holiday	Used to set a holiday of the week.
14	Time Set	Used to set the time of the day and change the time in weekly timer Function.
15	Set and Clear	Used to set and clear the weekly timer.
16	Jet Cool	Used to select jet cool mode.
17	Reset	Used to set the current time and clear the setting time.

Ceiling Concealed Duct Type:
CRNN –BH/BG/BE/BN/BJ

Floor Standing Type:
CRNN –CA/CB/CC/CD



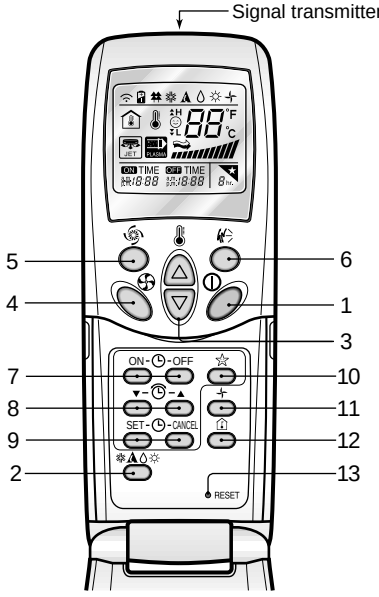
No.	Name	Function
1	Operation display	Displays the operation conditions.
2	On/Off	Operation starts when this button is pressed, and stops when the button is pressed again.
3	Set Temperature	Used to set the temperature when the desired temperature is obtained.
4	FAN Operation	Used to circulate room air without cooling or heating.
5	Fan Speed	Used to set the desired fan speed
6	Operation Mode Selection	Used to select the operation mode.
7	Timer Set	Used to set the timer when the desired time is obtained.
8	Timer Cancel	Used to cancel the timer.
9	Week	Used to set a day of the week
10	Program	Used to set the weekly timer.
11	Holiday	Used to set a holiday of the week.
12	Time Set	Used to set the time of the day and change the time in weekly timer Function.
13	Set and Clear	Used to set and clear the weekly timer.
14	Room Temperature Checking	Used to check the room temperature.
15	Reset	Used to set the current time and clear the setting time.
16	Signal Receptor	Used to take the signal from wireless remote control

1.2 Wireless Remote Control

1.2.1 Appearance and Functions

Appearance

Mounted Type: CRNN -SR/ST
Art Cool Type: CRNN -SP/SV/SU

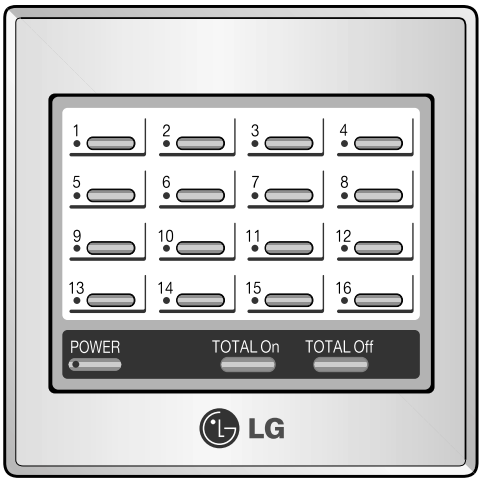


Functions (Button Descriptions)

No.	Name	Function
1	START/STOP	Operation starts when this button is pressed and stops when the button is pressed again.
2	OPERATION MODE SELECTION	Used to select the operation mode.
3	ROOM TEMPERATURE SETTING	Used to select the room temperature.
4	FAN SPEED SELECTOR	Used to select fan speed in four steps (low, medium, high, or CHAOS.)
5	JET COOL (JET HEAT: CRNN-SP only)	Used to start or stop the speed cooling/heating. (Speedcooling/heating operates super high fan speed in cooling mode.)
6	CHAOS SWING	Used to stop or start louver movement and set the desired up/down airflow direction.
7	ON/OFF TIMER	Used to set the time of starting and stopping operation.
8	TIME SETTING	Used to adjust the time.
9	TIMER SET/CANCEL	Used to set the timer when the desired time is obtained and to cancel the Timer operation.
10	SLEEP MODE AUTO	Used to set Sleep Mode Auto operation.
11	AIR CIRCULATION	Used to circulate the room air without cooling or heating (turns indoor fan on/off).
12	ROOM TEMPERATURE CHECKING	Used to check the room temperature.
13	RESET	Used prior to resetting time or after replacing batteries.

1.3 Simple Central Control

1.3.1 Features

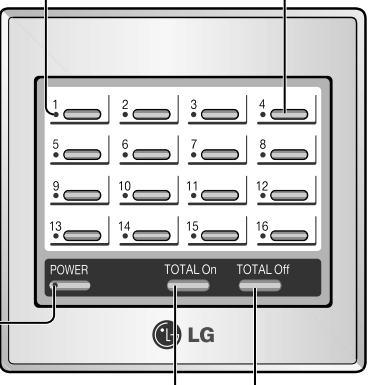


- Easy operation button.
- Independent operation for 16 indoor units each.
- Simultaneous turn ON/OFF for all of indoor units connected.
- Easy change operation mode to cooling or heating
- Set and clear lock-mode for each indoor unit
- Simultaneously set and clear lock-mode for all of indoor units connected.
- Display function for all of indoor units connected.

1.3.2 Term of Each part and Function

On/Off display LED (TOTAL 16EA)
- On pressing individual on/off button, display the present operation state.
  -Operation : green.
  -Stop : off
  -Error mode : blinking

Power display LED
- Indicate the state of DC Power supply in central controller unit.
  - On : red(Heating), green(Cooling)
  - Off : no signal
  - Error mode : blinking with red color



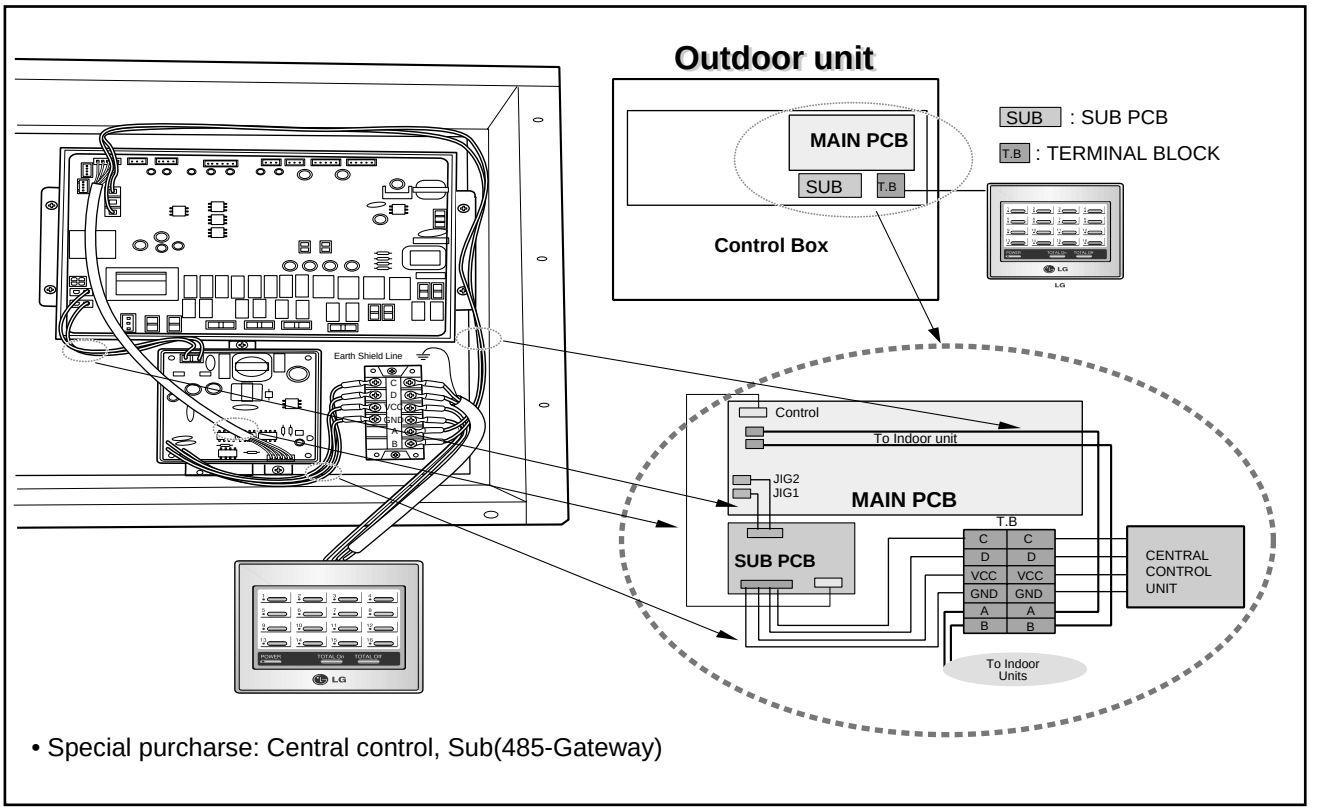
Individual On/Off button
- Control ON/OFF of a unit.

TOTAL Off button
- Stop all linked units sequentially.

TOTAL On button
- Operate all linked units sequentially.

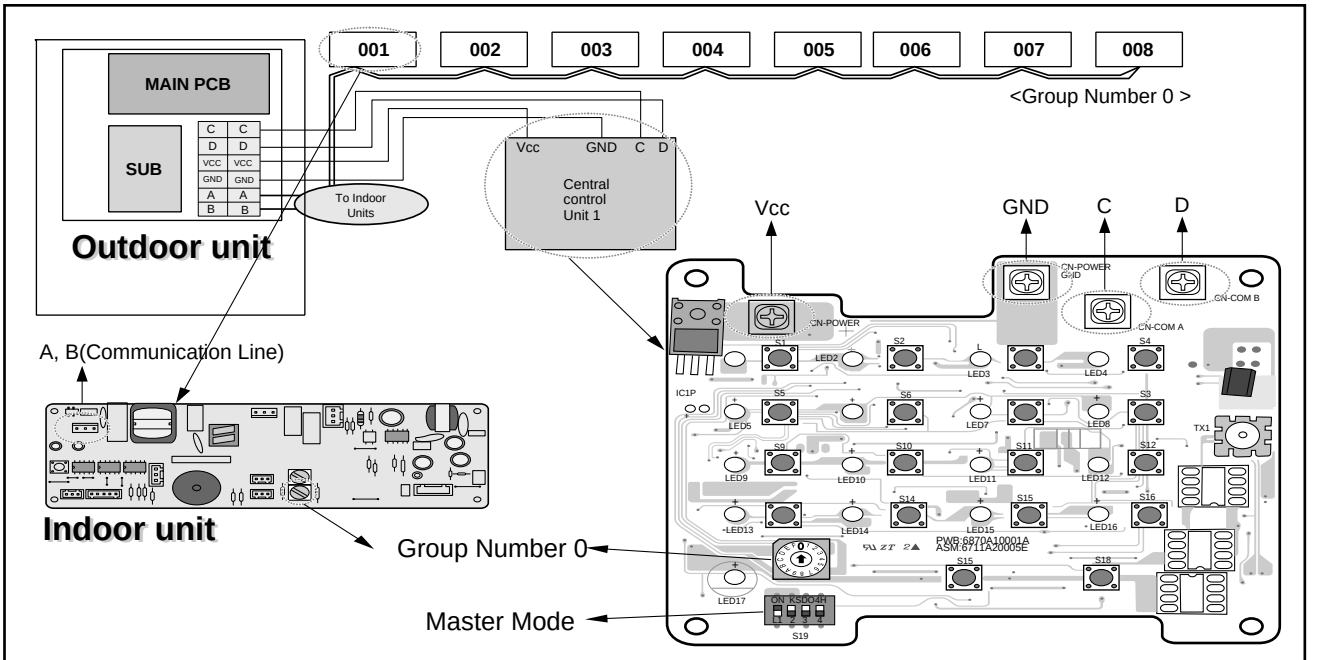
1.3.3 Electrical wiring

■ PICTORIAL VIEW OF THE CONNECTION



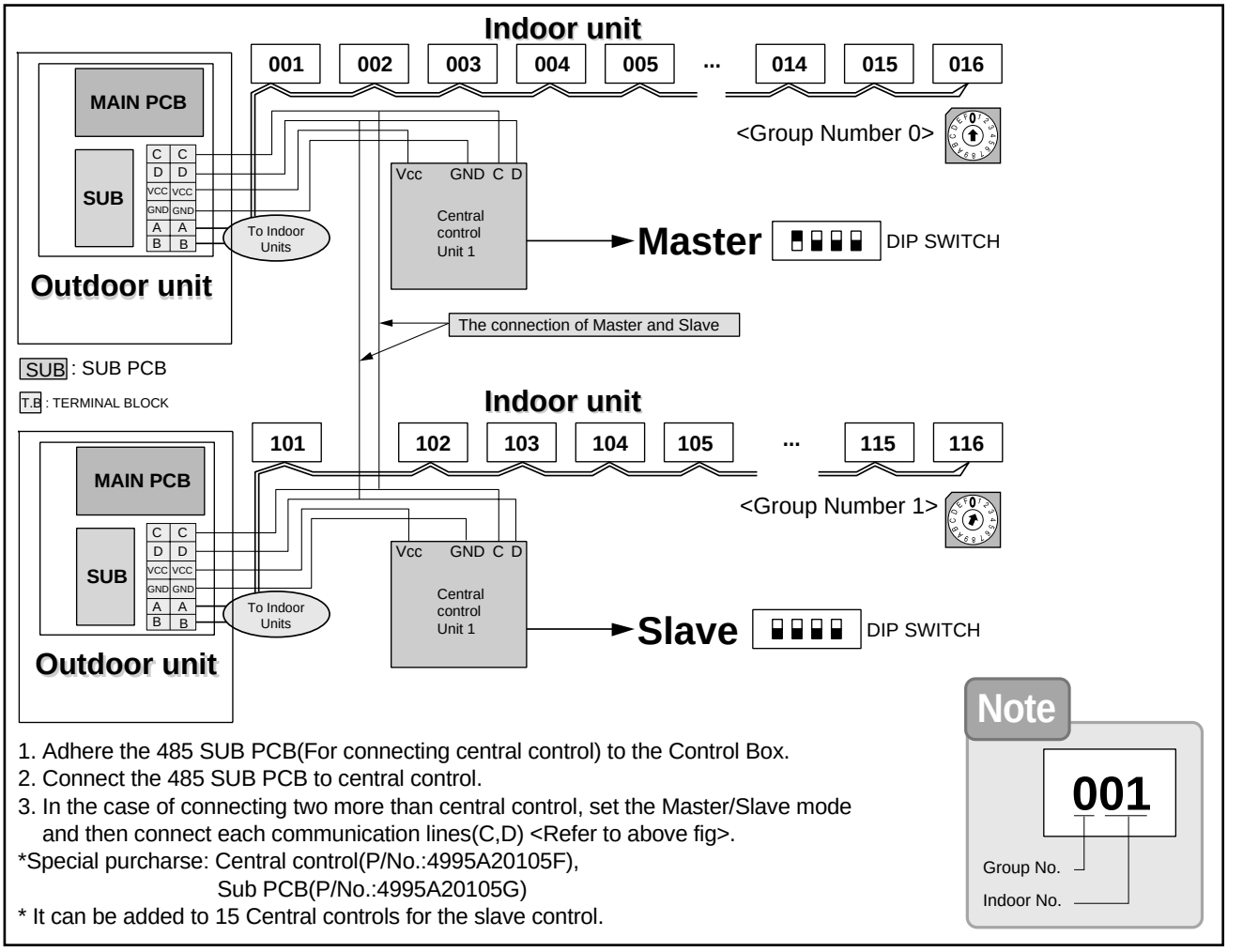
• Special purcharse: Central control, Sub(485-Gateway)

■ ONE SIMPLE CENTRAL CONTROL CONNECTION



All the connections are to be done as shown above.
A and B are the communication lines for the indoor and
C and D are the communication lines for the Central Control.
➡Use two shield lines for C/D connecting line.(Earth the shield line)

■ 2 OR MORE SIMPLE CENTRAL CONTROL CONNECTION



1. Adhere the 485 SUB PCB(For connecting central control) to the Control Box.
2. Connect the 485 SUB PCB to central control.
3. In the case of connecting two more than central control, set the Master/Slave mode and then connect each communication lines(C,D) <Refer to above fig>.

*Special purcharse: Central control(P/No.:4995A20105F),
Sub PCB(P/No.:4995A20105G)

* It can be added to 15 Central controls for the slave control.

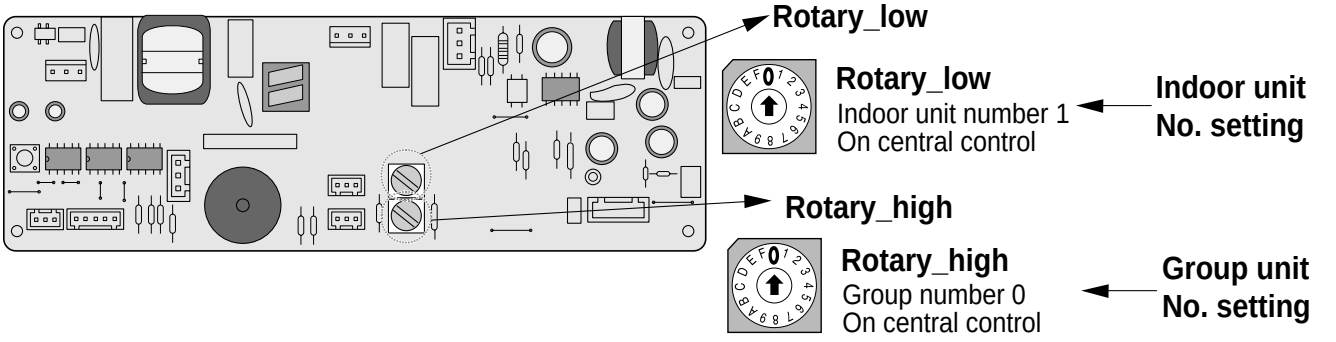
1.3.4 Indoor unit setting method

The indoor unit PCB has 2 rotary switches. One is for the Group Number setting and another is for Room Number Setting. The group number on the Central Control rotary switch and on the rotary switch of Indoor Unit PCB should match exactly.

Like: Group Number 0 on the Central Control = Group Number 0 on all Indoor units to be connected to Group Number 0.

But the Room Number switch on Central control is one increment of the rotary switch number on the Indoor PCB.

Like: Rotary switch number 0 on the indoor unit PCB means Room number 1 on the central control.

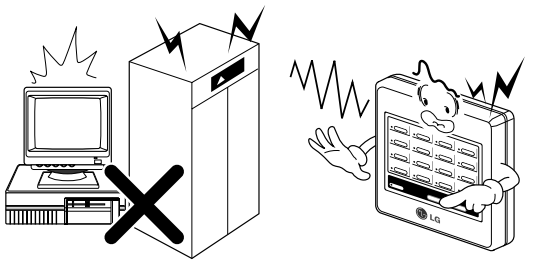
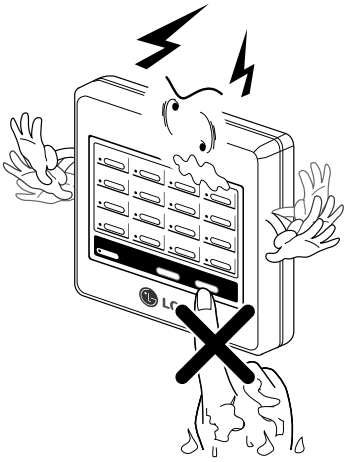
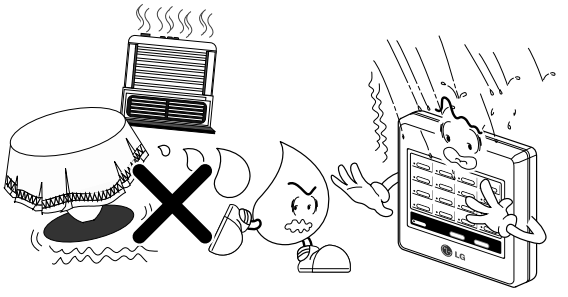
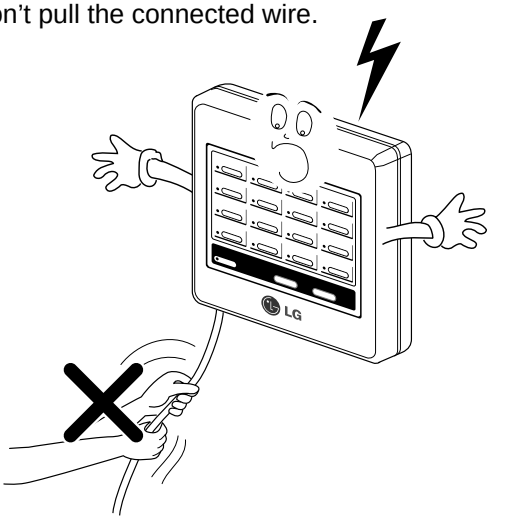
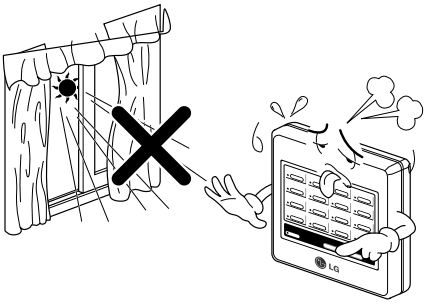


1.3.5 Test run method

1. Set the wiring of system and indoor unit.
2. Apply power to the setting.
3. Do auto addressing to the outdoor unit.
4. After addressing then initialize the central controller(Check up Dip Swtich ON('1')).
   - Cooling: Setting basically(Total On + Total Off + 4 key)
   - Heating: Total On + Total Off + 8 key ➡ Red power lamp 'On'
6. Check up On/Off with a related indoor key pressing.

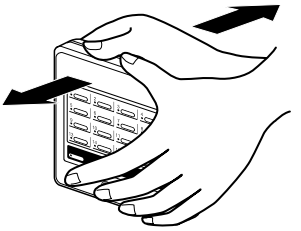
1.3.6 Installation

■ **CAUTIONS**

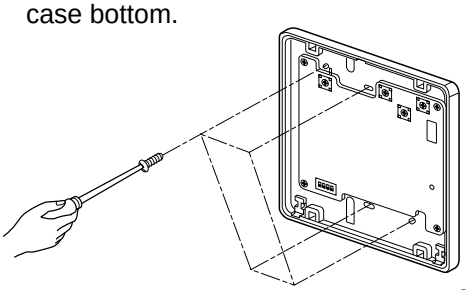
Do not install in this area	Keep in mind
• Don't install near elevator, computer, automatic door. (High noise area). 	• Don't operate with wet hands. 
• Don't install near high moisture & high oscillation area. 	• Don't pull the connected wire. 
• Don't install near direct sunlight as heat source. 	

■ INSTALLATION ORDER

1. Remove upper & lower case.



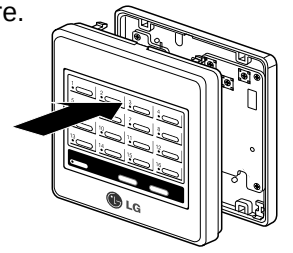
2. Fixate screw in the holes of the case bottom.



3. For Dip switch, and Rotary switch setting, refer to the page “How to Install”.

4. For wiring connection, refer page “Installation Procedure”

5. Adjust the upper case in accordance with back case while assembling as shown in the figure.



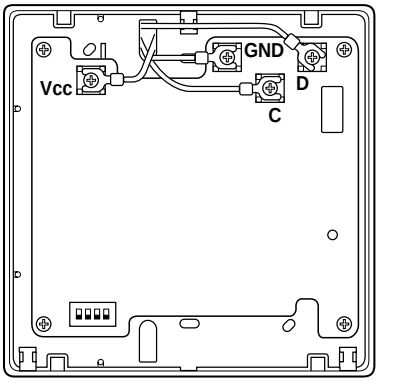
6. Check the operation by supplying the power.

■ LINK OF CONNECTING WIRE

1. First, separate the front case from rear case of controller, connect terminal C, D,Vcc, GND on PCB referring to the following table.

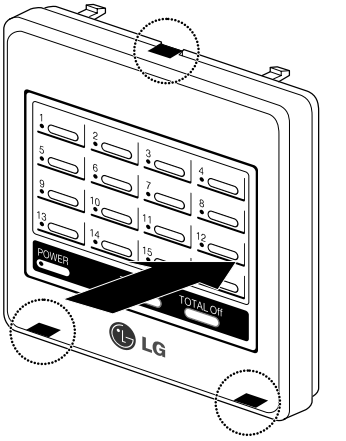
Maximum length of connecting wire

- Between controller and outdoor unit : 220m(25Ω)
- Between controllers : 220m(25Ω)



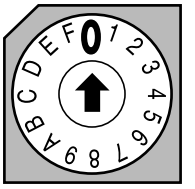
Out door unit Terminal Block	Wire Color	Central Controller Terminal
GND	← BLUE →	Vcc
Vcc	← Red →	GND
C	← Brown →	C
D	← Yellow →	D

2. After attaching the supplied wire to terminal, link the connecting wire. If necessary, Cut the indicated part of front case to draw the lead wire.



■. ROTARY SWITCH SETTING(INSTALLATION FOR 2 OR MORE SIMPLE CENTRAL CONTROL)

The setting of Group Number in the Central Control is done by the rotary switch as shown in the figure below.

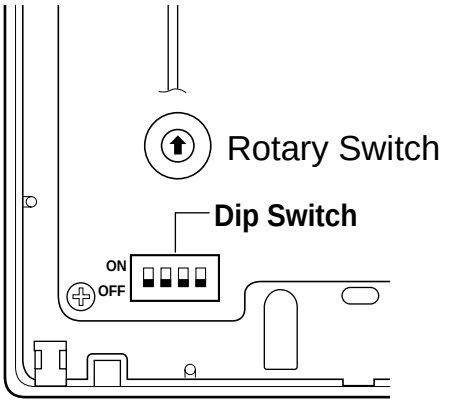


It is possible to set 0~15 Group(Total 16 Groups). All the numbers on the rotary switch represent the different Group Numbers. By changing the knob we can set rotary switch to the group number we want to control. The above fig. Shows the control of group number “0”. Similarly we can control all the 16 Groups.

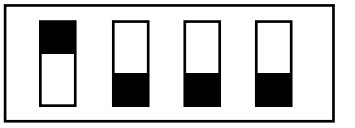
■. DIP SWITCH SETTING(INSTALLATION FOR 2 OR MORE SIMPLE CENTRAL CONTROL)

CAUTION

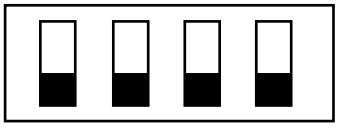
- Dip switch is now used only for the setting of master or slave mode.(In the case of two more than central controls.)
- Set one to Master, the others to slave.



Master Mode

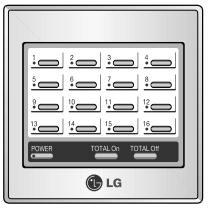
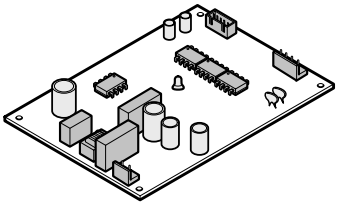
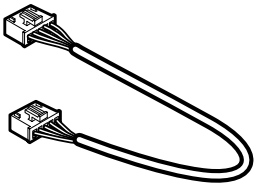
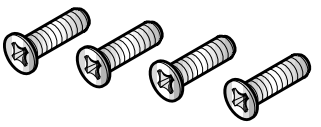
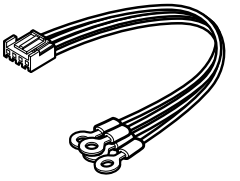
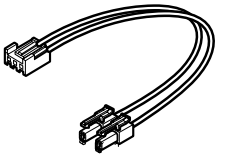


Slave Mode



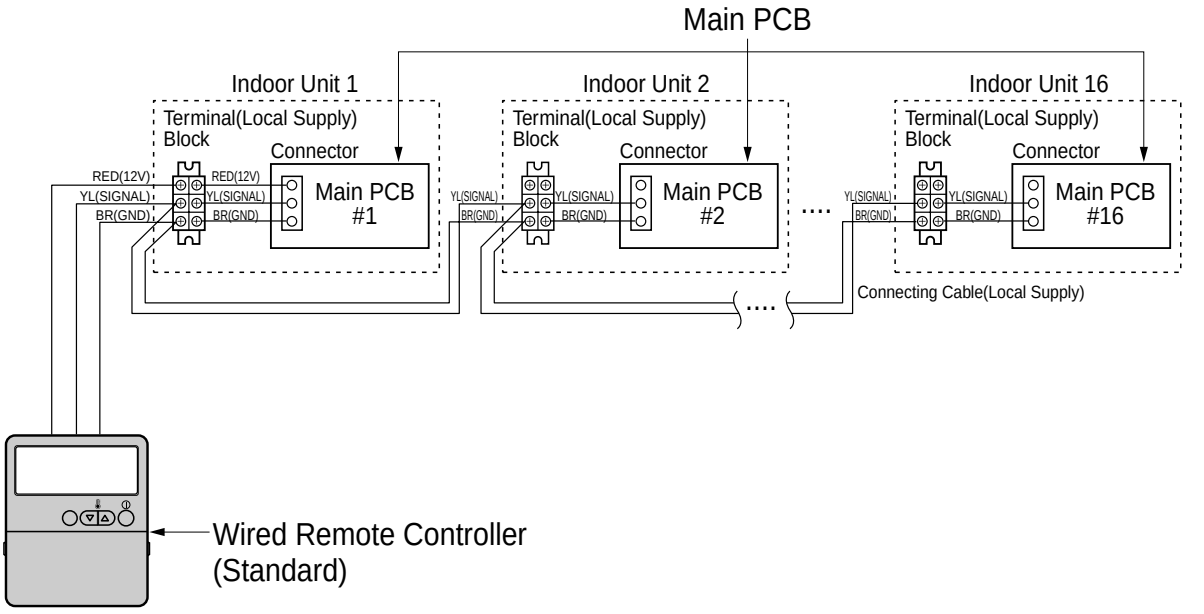
■. ACCEASSORY PARTS

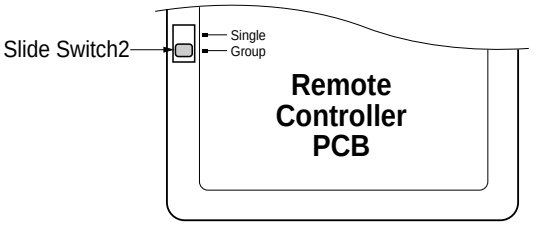
Central control and sub PCB(with wire ass'y) should be purchased as optional.

Central Control(1EA) 	**Sub PCB 6871A20295A** 	**Wire Assy 1** 
Screw(4EA) 	**Wire Assy 2** 	**Wire Assy 3** 

1.4 Group Control with Wired Remote Control

It operates maximum 16 Units by only one Wired Remote Control, and each Unit starts sequentially to prevent overcurrent.





- Using the supplied Wired Remote Control, wire them like above.
- Move slide switch 2 to "Group" position.
- Ensure that the color of wire.

CAUTION

- Be careful not to exchange the color of wires.
- The maximum length of connecting wire should be below 200m(25Ω) on connecting each units.
- Use a wire more than 0.5mm^2

2. Deluxe Central Control

2.1 Introlduction

2.1.1 Summary

Deluxe Central control is a product available for individual and integrated monitoring and control of maximum 256 of Multi V air conditioner systems. Specially operation status of the individual air conditioner can be particularly checked. Individual or simultaneous operation of the air conditioner, operation mode, wind quantity, user locking and temperature setup are also available.

Specially for this system, installation is simple and user's environment is excellent. Central control is available by a simple manipulation. In addition, this system have the self-battery built-in and can stably operate in spite of outside disturbance such as temporary power failure. This system has no need of additional peripheral equipment like UPS (Undisturbed Power System) and AVR to be purchased for stability when composing the existing PC central control system, and has so attractive advantage in installation costs.

Using the Deluxe Central control enables the management room to setup lock of each air conditioner and prevent indoor control of the individual air conditioner and restrain the necessary use. In case of releasing the lock, you may control the system by using the wire/wireless remote control at the place where the individual air conditioner is installed.

Setup of a weekly schedule is available and detailed schedule of the individual air conditioner can be easily setup through the GUI. Details of schedule setup can be immediately checked with a graph. This system is a product to meet energy saving and convenience at the same time at a place like a school by using this schedule function.

Defending on installation environment, location and conditions of use, you can setup groups. With this setup, more efficient operation at the center is available. Setup without requiring other equipment is available by using the GUI and change by the consumer is also available after installation.

You can reduce development time to configure special system upon the request by the consumer and conveniently this system by using the touch panel.

Where needs from a new customer occur or where purchase of additional air conditioner is done, the Deluxe Central control can be smoothly installed.

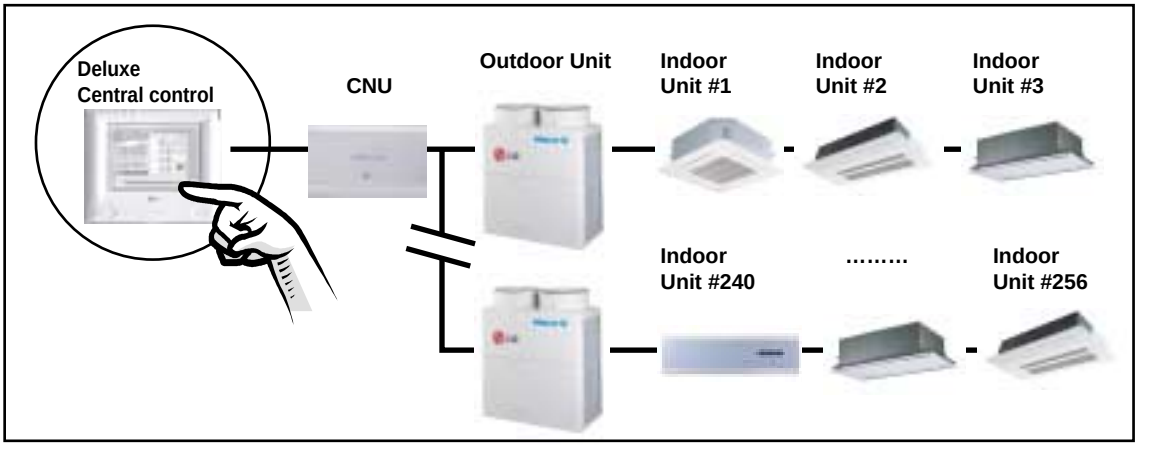


Figure 1) Overview of LG MultiV Central Control System

2.1.2 Major Characteristics

Figure 2) Deluxe Central control

1. Individual/Integrated Operation/Monitoring

■ You can identify operation status of the air conditioner, operation mode, wind quantity, wind direction, locking, temperature setting and error, etc by selecting the installed air conditioner through individual selection, group selection or all selection. Individual setup and operation of the detailed functions are available. Therefore, the manage can use a central control only with the Deluxe Central control installed at the control room at a building where a number of air conditioner are installed.

2. Group Management

■ Grouping management of the installed air conditioners is available. Thank to such group setup, separation by nature, location and size of each air conditioner enables convenient use. In addition, allotment of respective name to the setup group allows further intuitive management.

3. Self-diagnosis Function

■ The air conditioner installed can self-diagnosed its error status and then transmits the result to the central control. Therefore, a rapid countermeasure against failure of the air conditioner allows easy management and increases the use life of air conditioner.

4. Semi-permanent Life / Convenient Maintenance

■ Since the Deluxe Central control is designed for the semi-permanent use, this system can be used semi-permanently after installation differently from the existing PC or a large of central control system requiring a continuous management due to the life of peripheral and other PC.

5. Management Costs Down

■ In absence of the Central Control System, the manager controlled a number of air conditioners respectively, in addition, even if management was done at the center, there is only function of on/off management at best and thus 2 or 3 building managers were actually required. However, manipulation of all functions can be now done at a control room for the Deluxe Central control and so a manager can easily control all air conditioners. Automatic operation is also allowed without a manager if using schedule function.

6. Convenient GUI / Touch Screen

■ Not requires special education for using the Deluxe Central control, conveniently used only by pressing the buttons on the screen, and its function can be understood with intuitive pictogram. Especially schedule setting is done by simply dragging the screen as patented technology differently from the existing system requiring to press the button by more than average 30 times to enter a schedule.

7. Schedule Automatic Operation Management / Energy Saving

■ For the Schedule Automatic Operation, weekly setting is available. Enlisting of the schedule exception processing schedule (national holiday) is done for a year prevents the air conditioner from an unnecessary operation of air conditioner, allowing the system to be controlled at the center so that it can be only used for a necessary case and enabling to obtain excellent energy savin effect. Use of this function if there is a fixed schedule for elementary schoo, middle school, high school and college or university will get excellent effect.

8. Power Failure Backup Function / Powerful Stability

■ For the existing Central Control System, additional purchase of expensive UPS equipment in provision for a temporary power failure must be done in the past but for the Deluxe Central control, since the self-power failure compensation battery is built-in, power is automatically converted by maximum 2 hours. Therefore, there is almost no malfunction due to a temporary power failure because stable operation is available.

9. Mobility

■ A wireless radio system may be installed at the Deluxe Central control. You may control the system while directly going around the building with the wireless radio system and its self-battery function (100 m where there is no obstacle).

10. Convenient Installation

■ This system may be freely fixed to the wall surface with its small size, light weight and thin thickness and stood up on the desk by using a dedicated cradle. It is not almost subject to spatial restriction in installation space and location since this system communicates with on the basis of the I-GW and the Ethernet.

11. Stable Date Storage/Backup

■ Setup information is saved as it is even if no power is supplied since all date are saved in the built-in flash memory.

12. Scalability

■ Scalability of the system is easy in case of additionally purchasing equipment since scalable slot such as USB, Serial (RS-232c), PCMCIA, CF Type is prepared. This system is designed considering sufficient scalability in provision for special request by the customer.

13. Upgrade

■ Additional installation of a new program is available via the CF memory card and the existing program can be upgraded to a new program. Using such upgrade function always enables to construct a modern type of Central Control System.

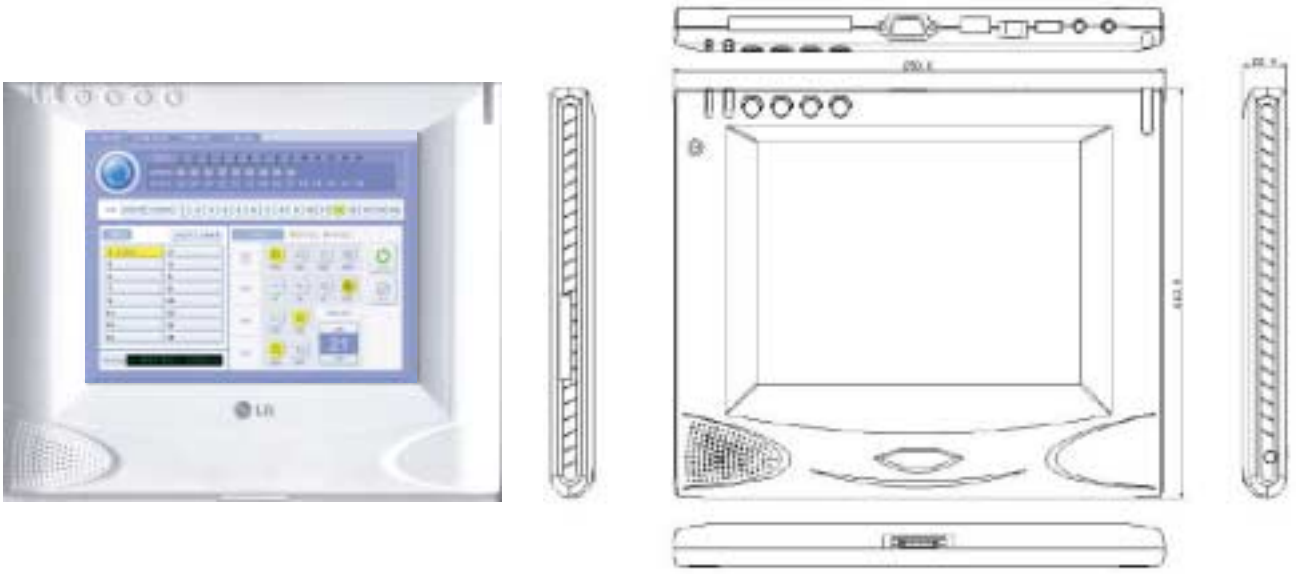


Figure 3) Deluxe Central control

Table 1) Comparison Between Central control Characteristics

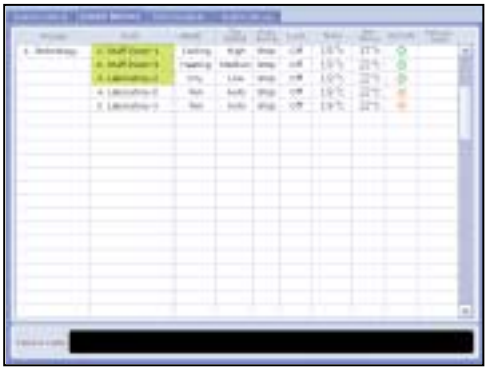
	Internet Central control	**PC Central control**	**Deluxe Central control**
Dedicate PC	Non-required	Required	Non-required
Configuration	User S/W	User S/W, Engine S/W	Main Body of Web Pad Deluxe Central control
Position of program	Download to i-GW	Installation	Built-in
Max. installation set numbers	256 sets (Less than 128 sets recommended)	256 sets[1)]	256 sets
Remote control	Available	-	-
Control & monitoring	Available	Available	Available
Schedule management	-	Available	Available
System setup	Available(Configure file modification)	Available	Available
System monitoring(overview)	-	Available	Available
User's lock	Available	Available	Available
Upgrade	Available	Available	Available
Touch screen	-	-	Built-in
Built-in Flash DB (backup)	-	-	Built-in
Wireless LAN (movable)	-	-	Available (option)
Installation on wall	-	-	Available
Non-interruption device	-	Separately add	Built-in
Requirements	Browser supporting JAVA	JVM (provided by MS)	-
Life	Semi-permanent	Peripheral devices & PC life	Semi-permanent

1) For the PC central control, installation set numbers may respond up to 1024 sets upon user's request.
2) JVM (Java Virtual Machine) is basically installed at the Windows but some versions of Window XP may be manually installed.

2.1.3 Major Function of Deluxe Central control

[System Control]

To check general monitor function of the air con central control system such as selection of group and air conditioner, air conditioner control monitor function etc.



[System Monitor]

To check the current actual time status of the whole of air conditioner.

PCS-W501A0

[System Set-up]

To manage the air conditioner through grouping and record setup of group and installation position, etc.

PCS-W501A0

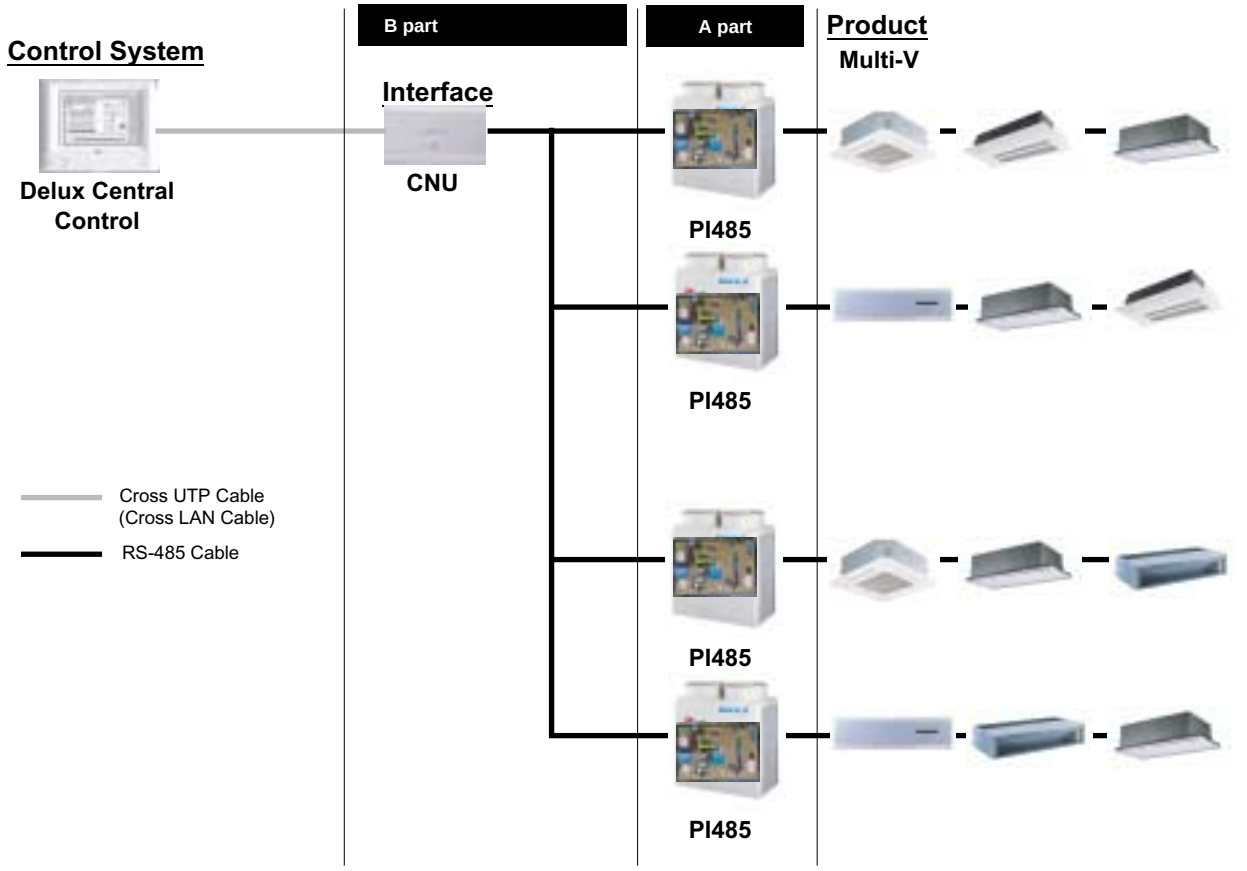
[Time Schedule]

Setup of a weekly schedule for all, group and individual air conditioner enables operation of the system. Processing through enlist of extra schedule for a year is available.

PCS-W502A0

2.1.4 System Configuration

Scenario 1 : In case of not using Internet access function



Main Specifications

1. Control System

- Centralized control of of maximum 256 indoor units
- Simple Touch PAD method
- GUI setting considering convenience of use
- Power failure compensation with independent Battery Built-in (Max. 2 hours)

2. CNU

- Combination of maximum 8 outside units
- 485 to Ethernet Converter Built-in

3. PI485

- 1 pcs per outdoor units (control of 8 outdoor units per bridge)

Note: - GUI(Graphic User Interface) may be changed without any notice, for improvement or options.

3. Installation

3.1 Transmission between indoor units and outdoor unit

1) Transmission cable

- Types : shielding wire CVVS or CPEVS
- Diameter : over 0.75mm^2
- Insulation material : PVC
- Maximum allowable temperature: 60°C
- Maximum allowable line length: under 300m

2) Remote control cable

- Types : 3-core cable
- Diameter : 0.5mm^2
- Maximum length: 100m(over 50m, use over 0.5m^2)

3) Simple central control cable

- Types : 4-core cable
- Diameter : over 0.75mm^2
- Insulation material : PVC
- Maximum allowable line length: under 100m

4) Separation of transmission and power lines

- If transmission and power lines are run alongside each other then here is a strong likelihood of operational faults developing due to interference in the signal wiring caused by electrostatic and electromagnetic coupling.
  The tables below indicates our recommendation as to appropriate spacing of transmission and power lines where these are to be run side by side

Current capacity of power line		Spacing
100V or more	10A	300mm
	50A	500mm
	100A	1000mm
	100A or more	1500mm

Note:

1. The figures are based on assumed length of parallel cabling up to 100m. For length in excess of 100m the figures will have to be recalculated in direct proportion to the additional length of line involved.
2. If the power supply waveform continues to exhibit some distortion the recommended spacing in the table should be increased.

- If the lines are laid inside conduits then the following point must also be taken into account when grouping various lines together for introduction into the conduits

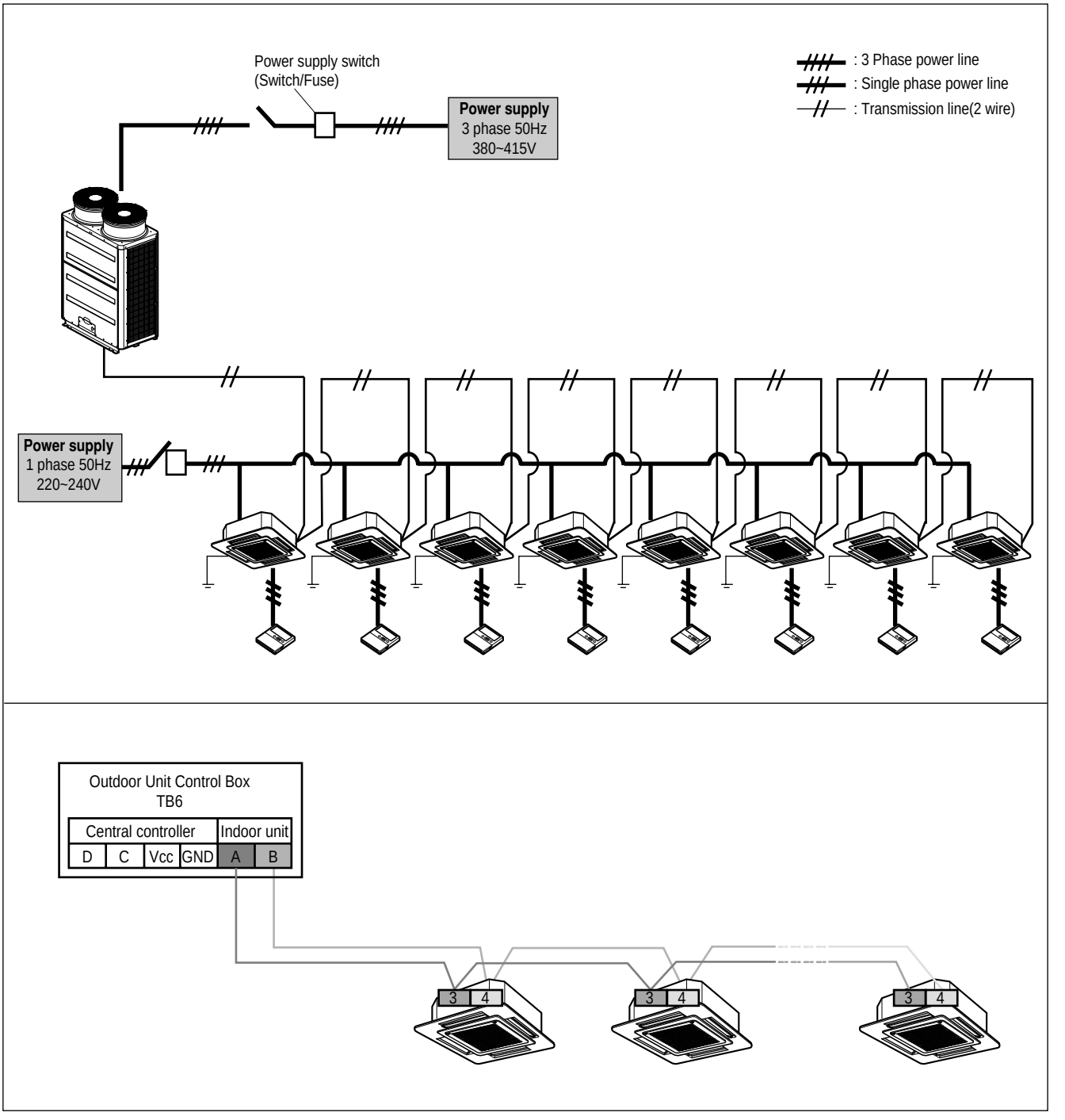
- power lines(including power supply to air conditioner) and signal lines must not be laid inside the same
- In the same way, when grouping the lines power and signal lines should not be bunched together.

CAUTION

- Have the indoor and outdoor units both been earthed?

■ If apparatus is not properly earthed then there is always a risk of electric shocks, the earthing of the apparatus must be carried out by a qualified person.

Example connection of transmission wire



3.2 Addressing of indoor units

• The address of indoor units would be set by Automatic addressing

- CRUN1008T0

① Press the switch(SW02M) of outdoor unit for 5 seconds

② 7-segment of Main PCB in outdoor unit : displays "88"

③ 2~3 minutes passed after ②, the address of each indoor unit is displayed at each wired remote controller or display device of each indoor unit.

- CRUN458S0

① Press the switch(SW01M) of outdoor unit for 5 seconds

② LED01C is ON.

③ 2~3 minutes passed after ②, the address of each indoor unit is displayed at each wired remote controller or display device of each indoor unit.

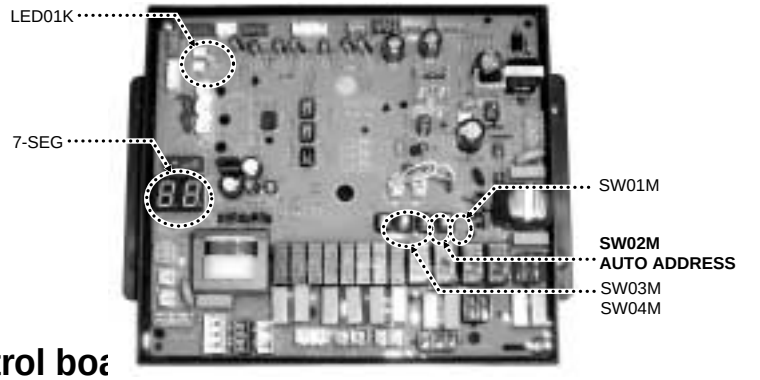
⚠ Caution

• In the Art Cool type (CRNN-SP, CRNN-SV) indoor unit, the address is not displayed after automatic addressing.

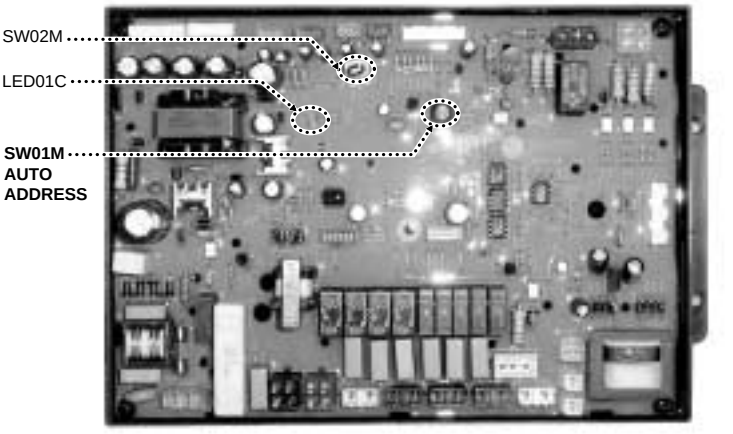
⚠ Warning

• If the PCB in indoor unit is replaced with new PCB for service, then the Automatic addressing should be executed.

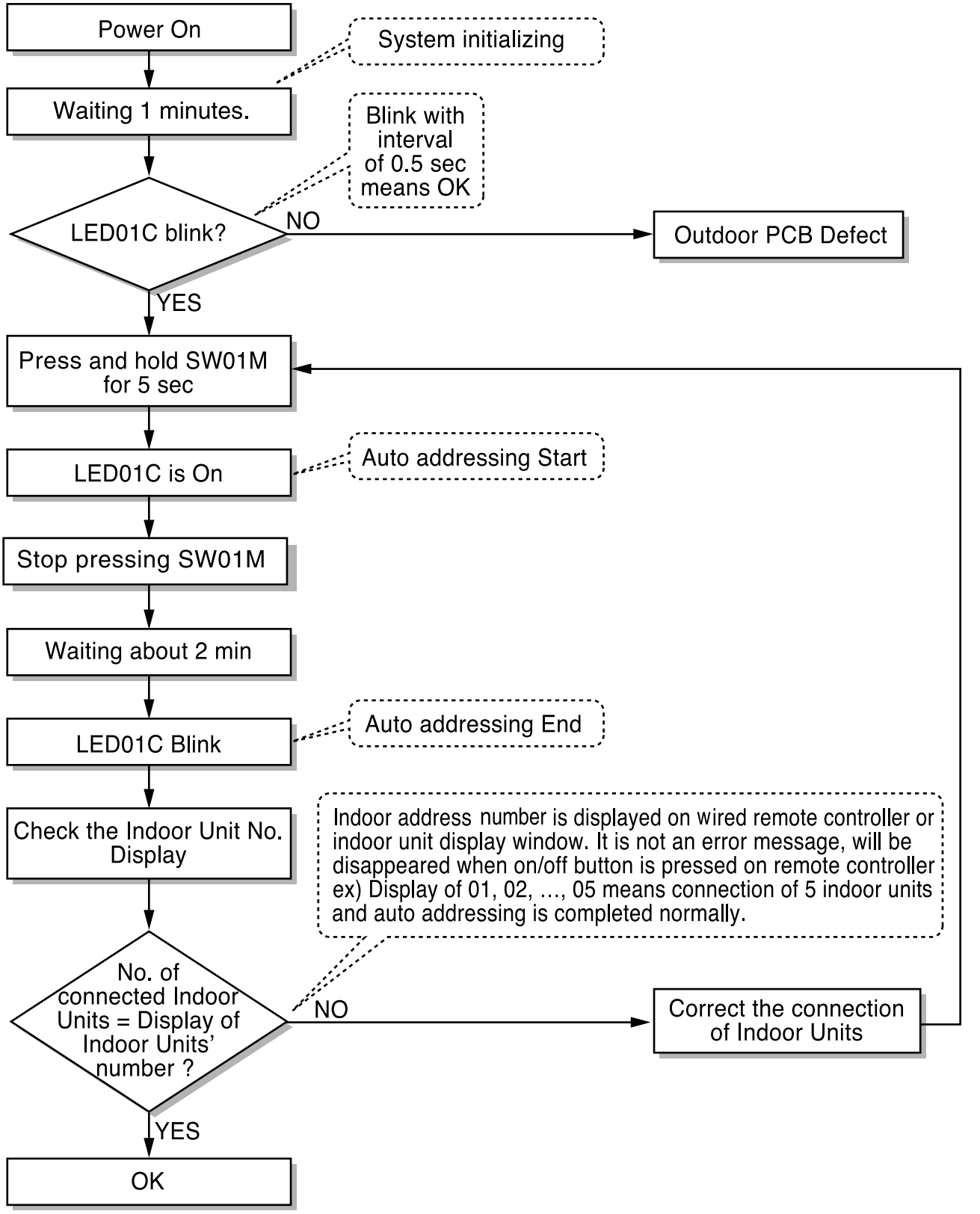
CRUN1008T0 Control board



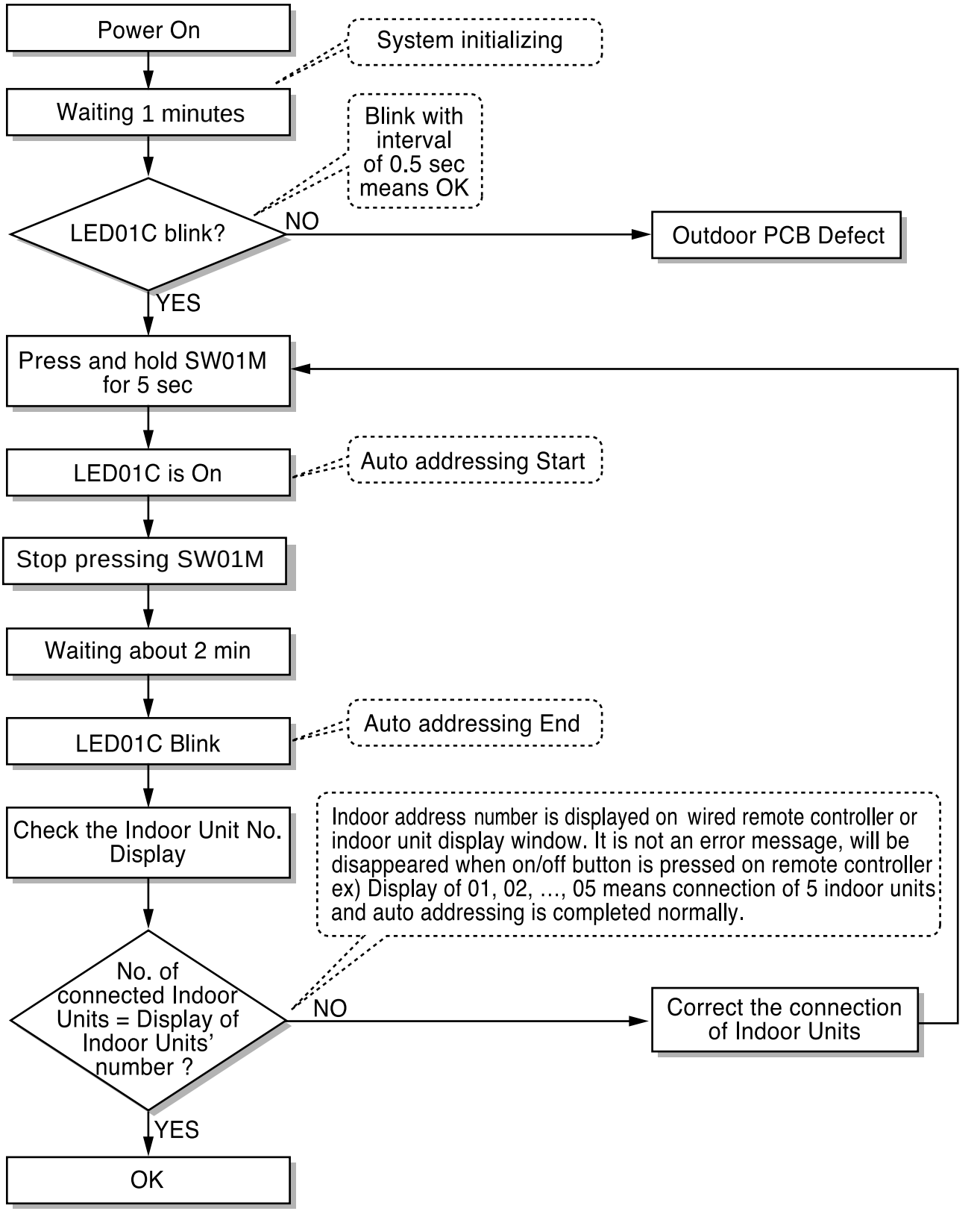
CRUN458S0 Control boa



The procedure of automatic addressing(CRUN1008T0)


Power On
System initializing
Waiting 1 minutes.
Blink with interval of 0.5 sec means OK
LED01C blink?
NO
Outdoor PCB Defect
YES
Press and hold SW01M for 5 sec
LED01C is On
Auto addressing Start
Stop pressing SW01M
Waiting about 2 min
LED01C Blink
Auto addressing End
Check the Indoor Unit No. Display
Indoor address number is displayed on wired remote controller or indoor unit display window. It is not an error message, will be disappeared when on/off button is pressed on remote controller ex) Display of 01, 02, …, 05 means connection of 5 indoor units and auto addressing is completed normally.
No. of connected Indoor Units = Display of Indoor Units' number ?
NO
Correct the connection of Indoor Units
YES
OK

The procedure of automatic addressing(CRUN458S0)


Power On
System initializing
Waiting 1 minutes
Blink with interval of 0.5 sec means OK
LED01C blink?
NO
Outdoor PCB Defect
YES
Press and hold SW01M for 5 sec
LED01C is On
Auto addressing Start
Stop pressing SW01M
Waiting about 2 min
LED01C Blink
Auto addressing End
Check the Indoor Unit No. Display
Indoor address number is displayed on wired remote controller or indoor unit display window. It is not an error message, will be disappeared when on/off button is pressed on remote controller ex) Display of 01, 02, ..., 05 means connection of 5 indoor units and auto addressing is completed normally.
No. of connected Indoor Units = Display of Indoor Units' number ?
NO
Correct the connection of Indoor Units
YES
OK

3.3 Group number setting for indoor units

3.3.1 Process fot Group Number Setting

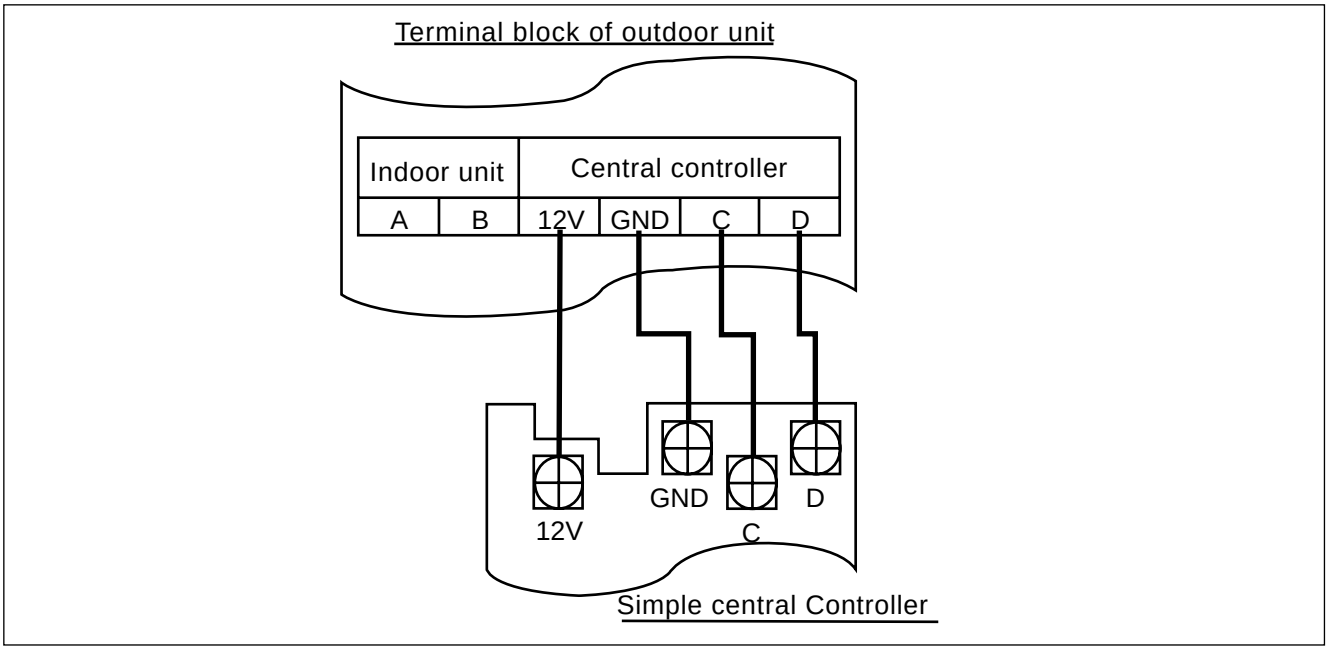
① Confirm the power of whole system(indoor unit, outdoor unit) is OFF, otherwise turn off.

② The transmission lines connected to C, D of simple central controller should be connected to C,D terminal port for central control of outdoor unit with care for their polarity (C → C, D → D)

③ DC power line(12V) and ground line should be connected to terminal block of adjacent indoor unit

④ Set group number with increasing the rotary switch From 00 to 7F in orderly manner (if it is desired to control several indoor units as a group, each group control is possible by group ID rotary switch setting from 0 to 7)

⑤ The whole system power turn on.



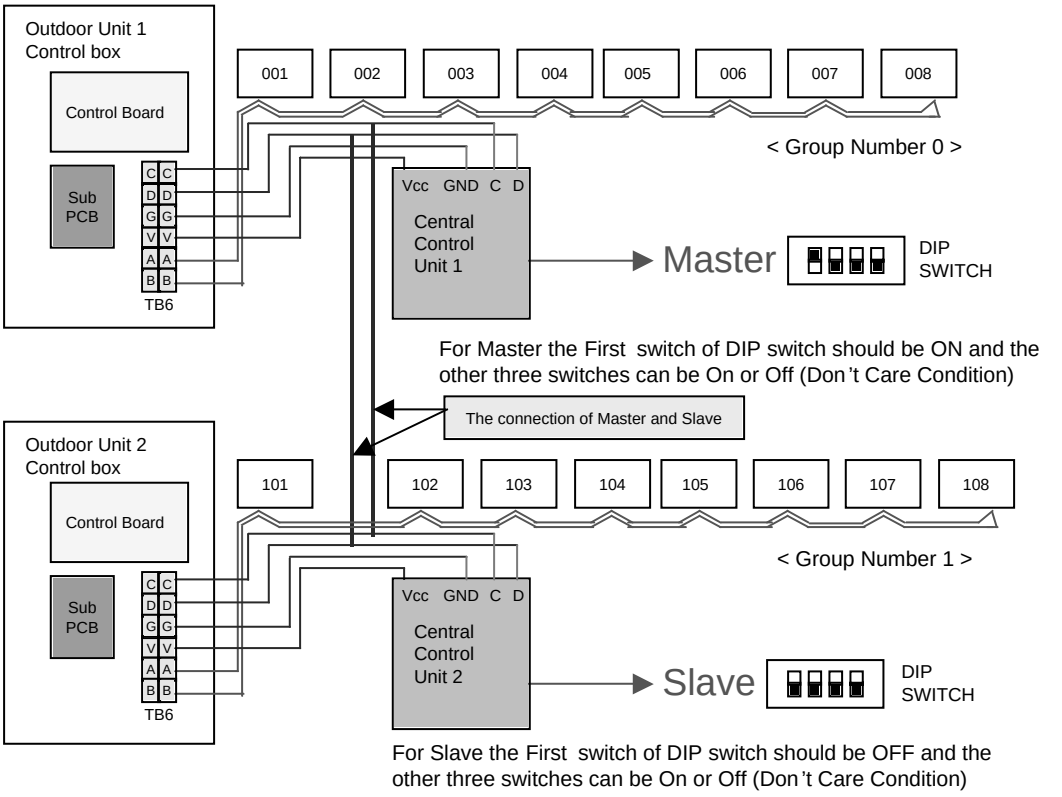
• Group number of each indoor unit is set with rotary switch of control PCB in each indoor unit

• Before power is supplied the rotary switch for simple central controller on the indoor unit PCB should be set

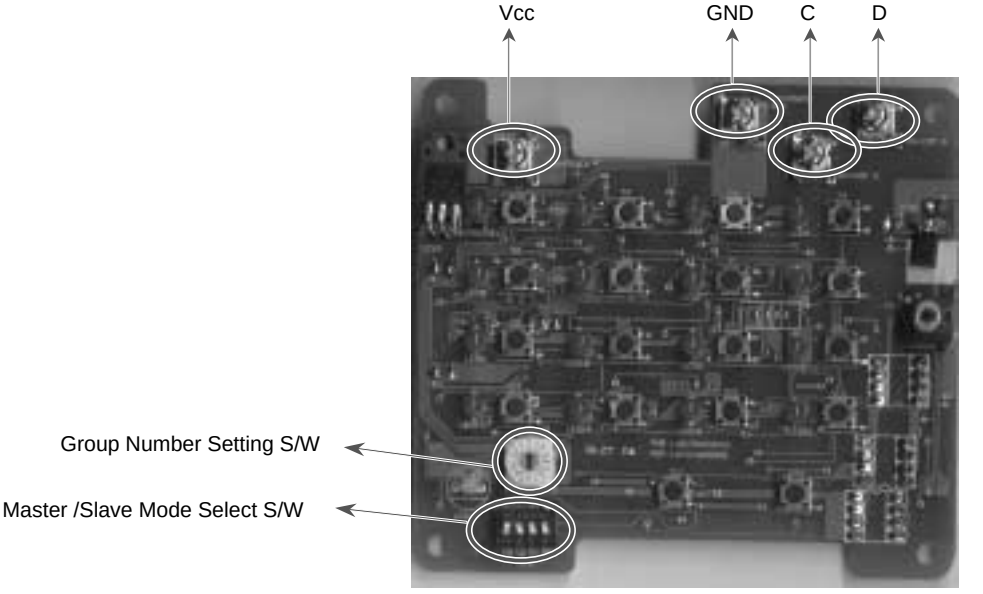
• ID Mapping of Rotary Switch is following table

Each rotary switch setting in Indoor		Simple central controller recognition
SW01M(GROUP)	SW02M(UNIT)	
0	0~F	1st Group, 0~F Unit
1	0~F	2nd Group, 0~F Unit
2	0~F	3rd Group, 0~F Unit
3	0~F	4th Group, 0~F Unit
4	0~F	5th Group, 0~F Unit
5	0~F	6th Group, 0~F Unit
6	0~F	7th Group, 0~F Unit
7	0~F	8th Group, 0~F Unit

Wiring Diagram for Simple Central Control

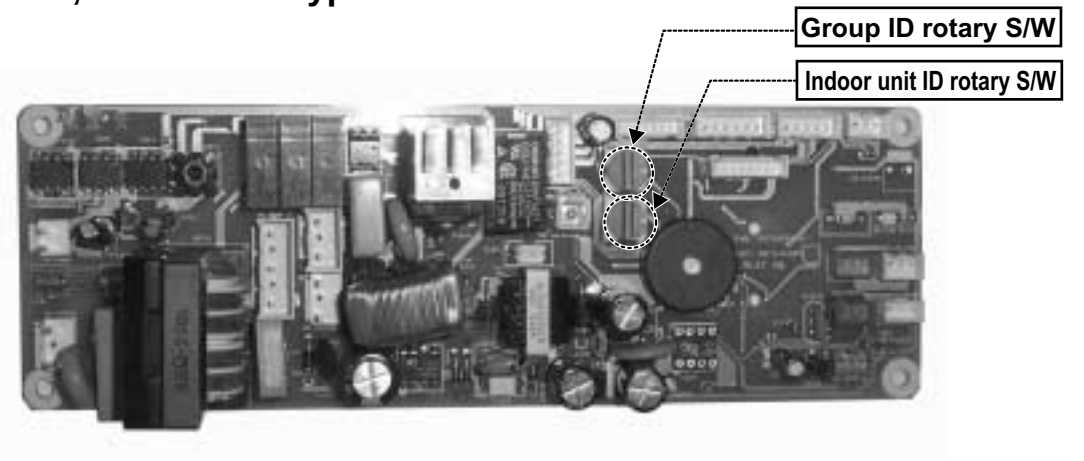


❑ PC Borad of Simple Cental Control

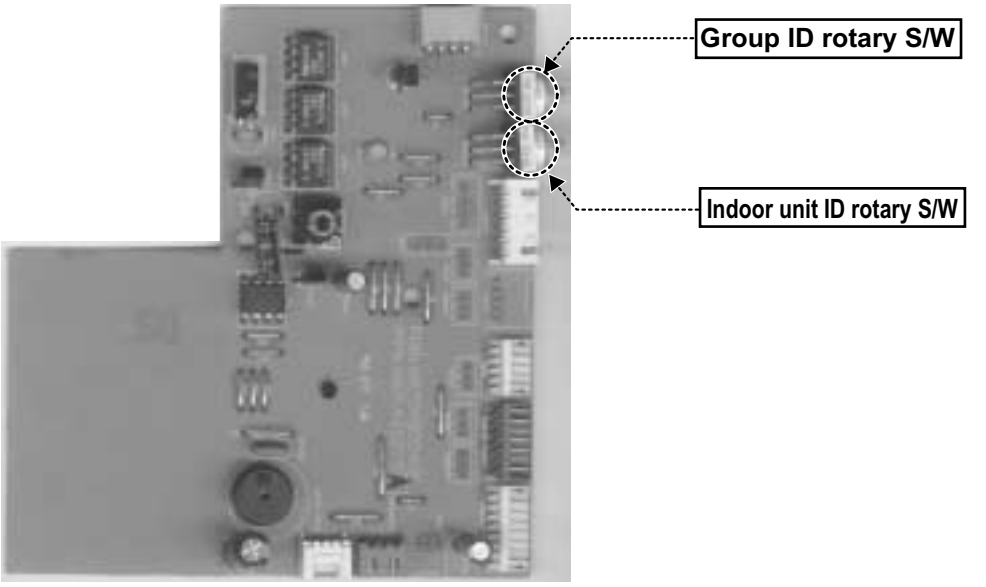


Position of rotary switch on the indoor unit

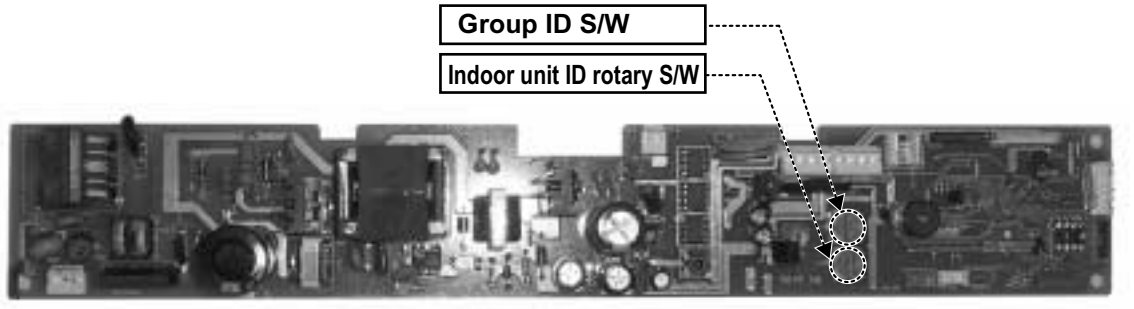
Cassette, Duct, Convertible type indoor unit



Wall Mounted type indoor unit



Artcool type indoor unit

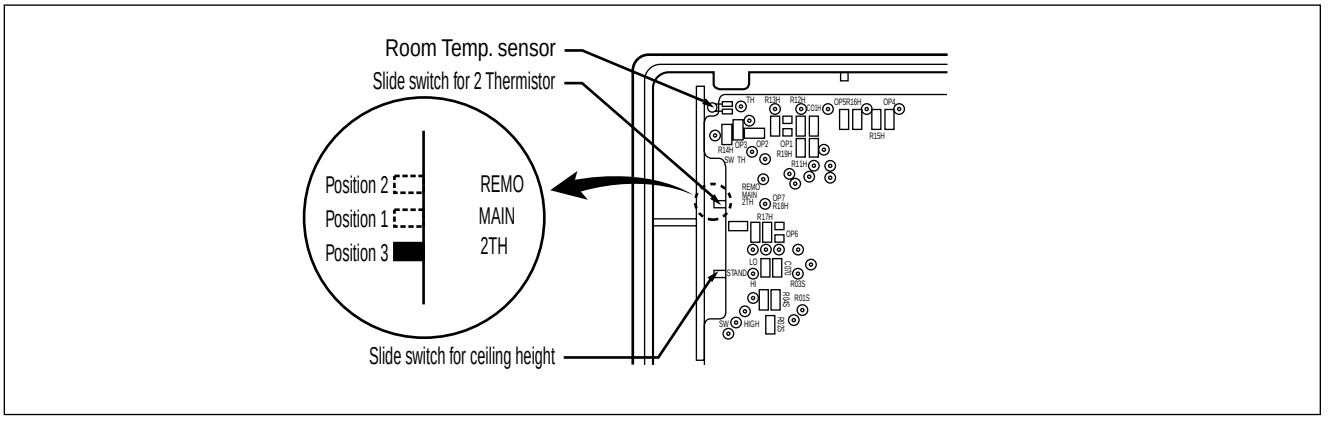


3.4 Optional operation

1) Two Thermistor System

(1) Open the rear cover of the wired remote-controller to set the mode.
(2) Select one of three selectable modes as follows.
- Position 1:
  The room temperature is controlled by the thermistor of the main body.
- Position 2:
  The room themperature is controlled by the thermistor of the wired remote-controller, control the temperature according to the position of wired remote-controller.
- Position 3:
  The room temperature is controlled by lower temperature between the temperature of main body and of remote-controller sensor.

(3) Move the slide switch to set position.



(4) Close the rear cover and check if it works normally.

⚠ CAUTION

- Select the position after counselling with a customer.
- In case of cooling mode, room temperature is controlled by the main body sensor.
- To control the room temperature by a wired remote controller, install controller(room temperature sensor) to sense the temperature more accurately.
- Maunfactured in the position 3.

2) Adjusting air volume to the height of ceiling

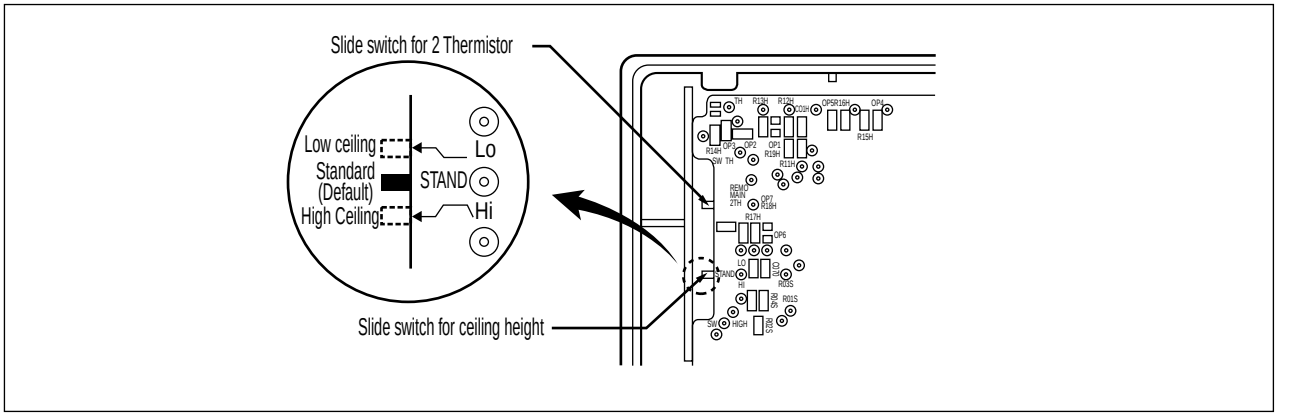
You can choose the RPM(or air volume) of indoor motor according to the height of ceiling to supply the comfortable atmosphere to consumers.

Procedure

1. Choose the selectable position in the table after measuring the height of ceiling.

Ceiling height	Mode of slide switch	Change of air volume	Remark
more than 4.0m	High Ceiling	Increasing	Maunfactured in standard mode
3.2~4.0m	Standard	-	
less than 3.2m	Low Ceiling	Decreasing	

2. In the case of changing the height as "high" or "low", open the rear cover of the wired remote-controller.
3. Move the slide switch to the set position.



4. Close the rear cover and check if it works nomally.

Trouble shooting guide

Trouble shooting guide

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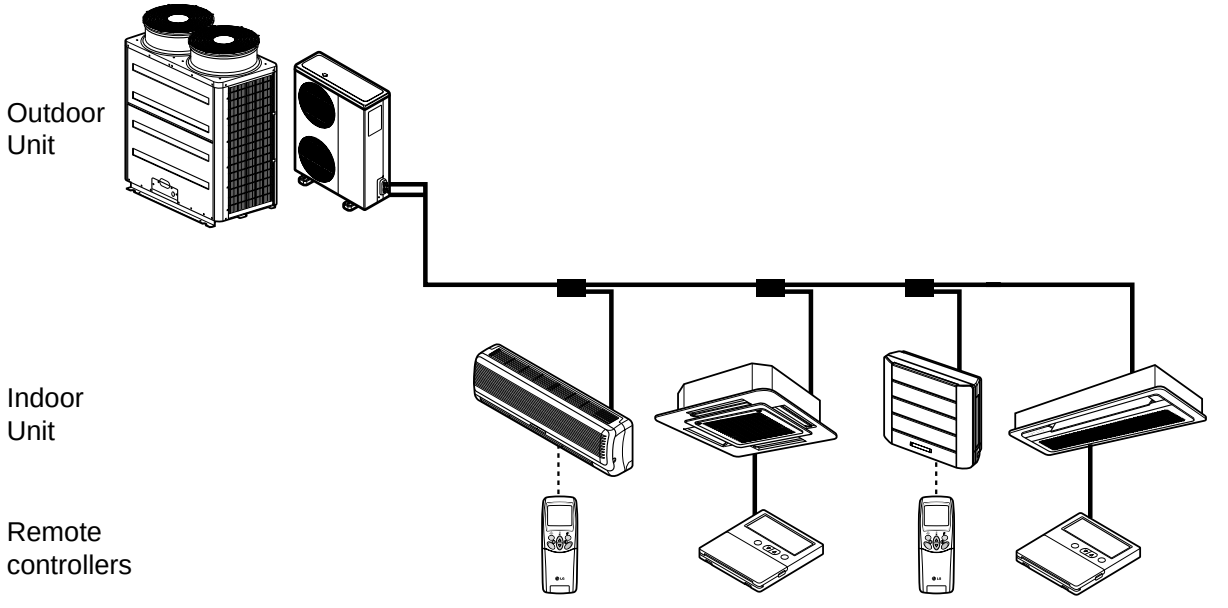
1. The phenomena from main component failure

The phenomena from main component failure

Component	Phenomenon	Cause	Check method and Trouble shooting
Compressor	Not operating	Motor insulation broken	Check resistance between terminals and chassis
		Strainer locking	Service necessary
		Oil shortage	Open drain cock and check oil
	Stop during running	Motor insulation failure	Check resistance between terminals and chassis
	Loud noise during running	Phase sequence fault	Check wiring(R, S, T) sequence, or lnter change last two phase connection.
Outdoor fan	High pressure error at cooling	Motor failure, Bad ventilation around outdoor heat exchanger	Check the outdoor fan operation after being turned the outdoor unit off for sme time. Remove obstacles around the outdoor unit
Outdoor LEV	Heating failure, frequent defrosting	Bad connector contact	Check connector
	No operating sound at applying power	Coil failure	Check resistance between terminals
	Heating failure, Frozen outdoor heat exchanger part	LEV clogged	Service necessary
	Low pressure error or discharge temperature error	LEV clogged	Service necessary

When system fault occurs, the error code is displayed at indoor unit display or remote control display, the trouble shooting guide is in the service manual



2. Checking Method for Key Fompornents

2.1 Compressor

Caution **Turn-off the main power of the indoor/outdoor unit before check**

Cheking Method 1 Check the compressor

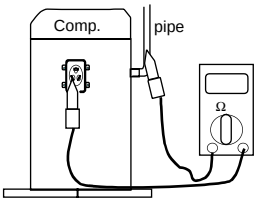


Figure 1.

1. Check an electric leakang with DC 500V megger

① Uncover the compressor terminal cover, and then unplug compressor power cable from the terminal.

② Set the checking range to resistance(Ω)

③ Check the insulation resistance between pipe and each terminal(U,V,W) as described in figure 1.
If the insulation resistance is not less than than the value listed in the table 1, then the compressor is normal

Table 1.

Environment air temperature is 20˚C

Resistance (MΩ)	
The refrigerant is charged	Therefrigerant is not charged
1	30

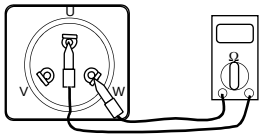


Figure 2.

2. Check a short-circuit in the compressor with tester

① Uncover the compressor terminal cover, and then unplug compressor power cable from the terminal.

② Set the checking range to resistance(Ω)

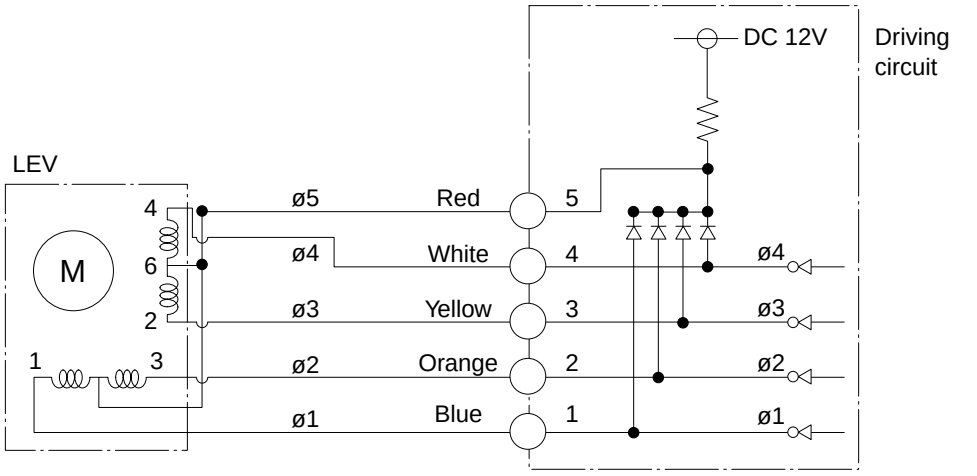
③ Check the resistance between each terminal(U,V,W) as described in figure 2.
If the measured value of the resistance is out of the tolerance range listed in the table 2, then the compressor is not normal.

Table 1.

Environment air temperature is 20˚C

Resistance (MΩ)	
JT100BEVYE (Inverter)	DT212DATYE (Normal)
1.4 ± 7%	1.8 ± 7%

2.2 Linear Empansion Valve



• Pulse signal output value and valve operation

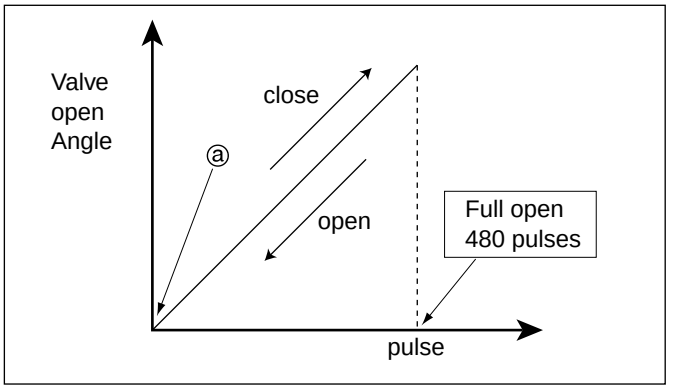
Output(ø) No.	Output state							
	1	2	3	4	5	6	7	8
ø1	ON	OFF	OFF	OFF	OFF	OFF	ON	ON
ø2	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
ø3	OFF	OFF	ON	ON	ON	OFF	OFF	OFF
ø4	OFF	OFF	OFF	OFF	ON	ON	ON	OFF

• Output pulse sequence

- In valve close state: 1 → 2 → 3 → 4 → 5 → 6 → 7 → 8 → 1
- In valve open state: 8 → 7 → 6 → 5 → 4 → 3 → 2 → 1 → 8

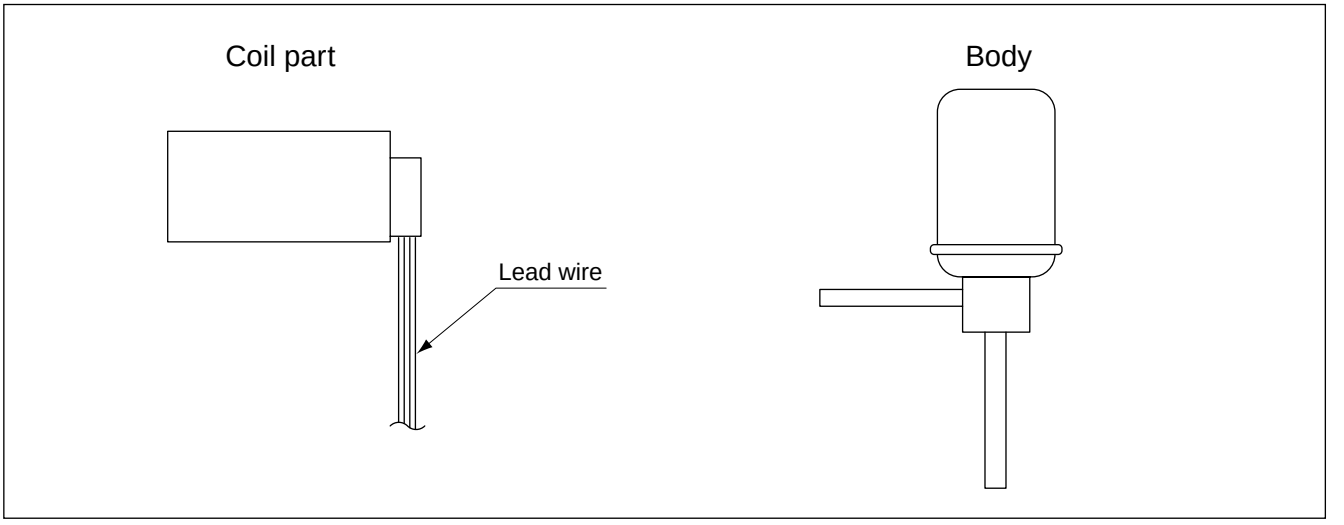
* 1. If LEV open angle is not change, all of output phase will be OFF
2. If output phase is different or continuously in the ON state, motor will not operate smoothly and start vibrating.

• LEV valve operation

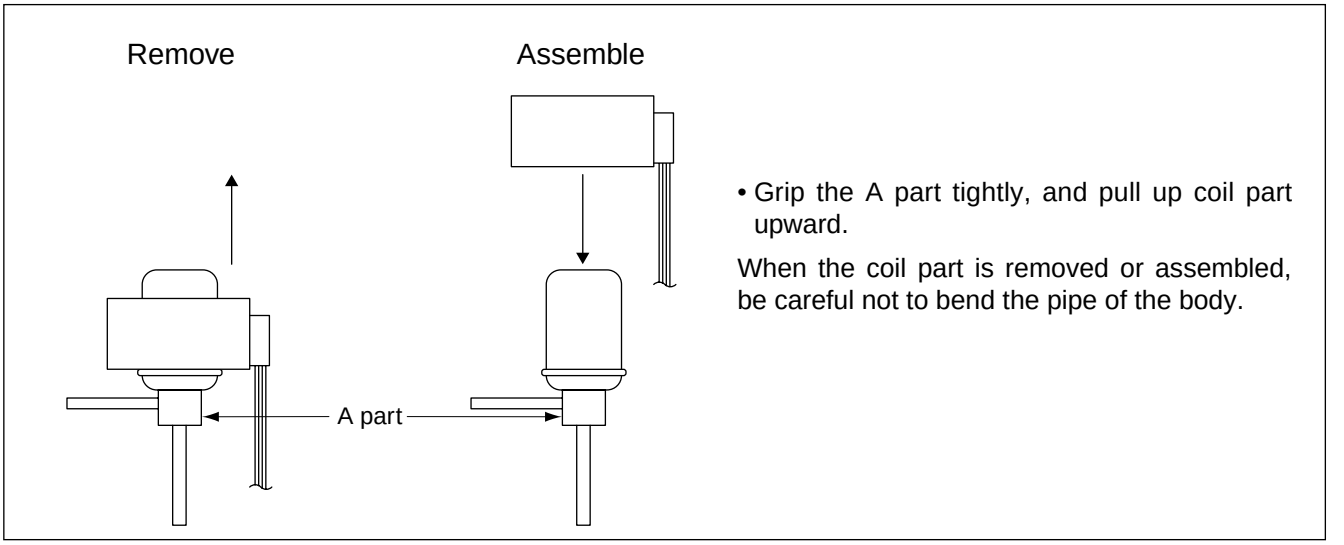


- At power ON, open angle signal of 520 pulses output and valve position is set to ⓐ
  If valve is operated smoothly, no noise and vibration is occurred and if valve is closed. noise occurs.
- If you contact screw driver to LEV, and contact your ear to driver hand grip. you can confirm the noise from LEV.
- If liquid refrigerant is in LEV, the noise is lower.

• LEV Coil and body(Outdoor unit)



• Remove and assemble the coil

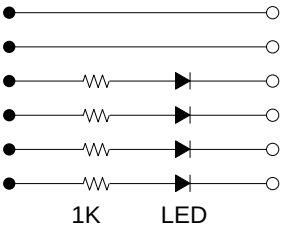


• Grip the A part tightly, and pull up coil part upward.

When the coil part is removed or assembled, be careful not to bend the pipe of the body.

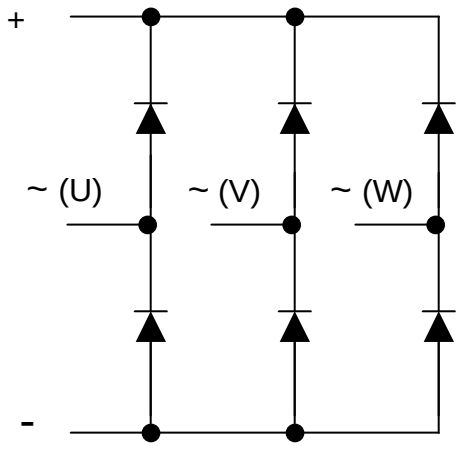
• LEV failure check method

* Attention: Outdoor unit LEV and Indoor unit LEV are different in specification, so the repair process may be different

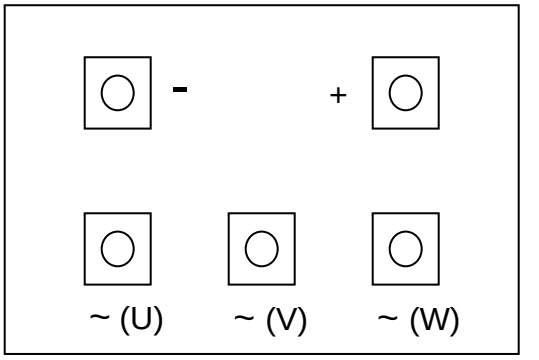
Failure mode	Diagnosis	Repair process	Unit
Microcomputer Driving circuit failure	1.Disconnect the LEV connector form control board and connect testing LED  2. Main power ON, pulse signal is out from LEV for 17 sec. If LEDs do not turn on, or are in on state continuously, then driving circuit is abnormal	Check and replace Indoor unit control board	Indoor unit
LEV locking	1.If LEV is locked, in no load state, the driving motor rotate, and clicking sound always occurs	Replace LEV	Indoor / Outdoor unit
LEV Motor coil short or misconnection	1. Check the resistance between coil terminal (red-white, red-yellow, red-orange, red-blue) 2. If the estimated resistance value is in 52 ± 3Ω then the LEV is normal	Replace LEV	Outdoor unit
	1. Check the resistance between coil terminal (brown-white, brown-yellow, brown-orange, brown-blue) 2. If the estimated resistance value is in 150 ± 10Ω then the LEV is normal	Replace LEV	Indoor unit
Full closing (valve leakage)	1. Operate indoor unit with FAN mode and operate another indoor unit with COOLING mode 2. Check indoor unit(FAN mode) liquid pipe temperature (from operation monitor of outdoor unit control board) 3. When fan rotate and LEV is fully closed, if there is any leakage, then the temperature is down If estimated temperature is very low in comparison with suction temperature which is displayed at remote controller then the valve is not fully closed	If the amount of leakage is much, Replace LEV	Indoor unit

2.3 3Phase Bridge Diode

Internal circuit diagram



Appearance



1. Unplug the + terminal of electrolytic capacitor from the + terminal of 3phase bridge diode

2. Set the multi meter to resistance mode
   Check and estimate the resistance between each pair of terminal (+, -), (+, ~(U)), (+, ~(V)), (+, ~(W)), (~(U), -), (~(V), -), (~(W), -), the estimated value should be large enough to Mega Ohm unit.

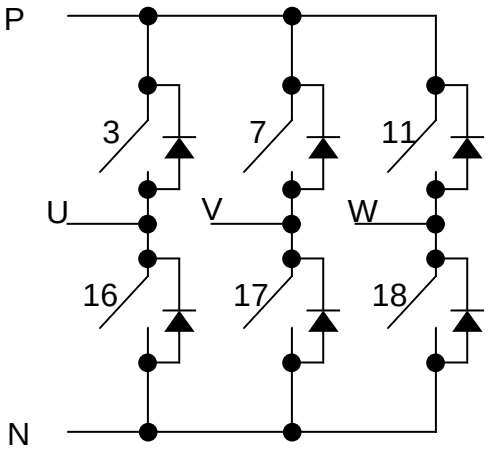
3. Set the multi meter to diode mode, and estimate between each pair of terminal (~(U), +), (~(V), +), (~(W), +), (-, ~(U)), (-, ~(V)), (-, ~(W)), the estimated value should be stable and be in between 0 to 1. (ex: 0.35, 0.46 etc.)

If one of the above articles is not satisfied, bridge diode must be inferior and to be replaced

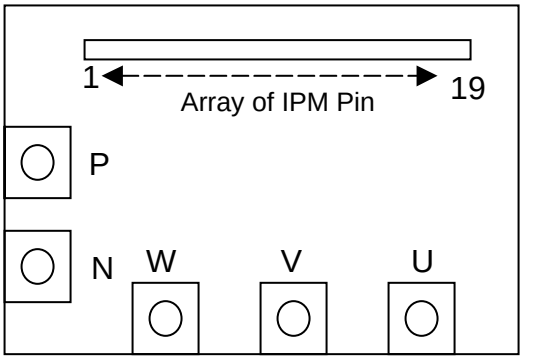
Caution **In case that the control box is opened and before checking electrical parts, it should be checked that the LED 01Y (in inverter board, refer to page 172) turned off (wait 3 minutes after main power OFF), otherwise it may cause electrical shock.**

2.4 IPM(Integrated Power Module)

Internal circuit diagram



Appearance



1. Unplug the +, – terminal of electrolytic capacitor from the P and N terminal of IPM
2. Set the multi meter to resistance mode
   Check and estimate the resistance between each pair of terminal
   (P, N), (P, U), (P, V), (P, W), (U, N), (V, N), (W, N), the estimated value should be large enough to Mega Ohm unit.
3. Set the multi meter to resistance mode
   Check and estimate the resistance between each pair of terminal
   (3, U), (7, V), (11, W), (16, N), (17, N), (18, N), the estimated value should be large enough to Mega Ohm unit.
   the check point is inside of the screw hole **(U, V, W, N),** if check points are plate face of the terminal, then estimated values are gate resistance.
4. Set the multi meter to diode mode, and estimate between each pair of terminal **(U, P), (V, P), (W, P), (N, U), (N, V), (N, W),** the estimated value should be stable and be in between 0 to 1. (ex: 0.35, 0.46 etc.)

If one of the above articles is not satisfied, IPM must be inferior and is to be replaced

Caution **In case that the control box is opened and before checking electrical parts, it should be checked that the LED 01Y (in inverter board, refer to page 172) turned off (wait 3 minutes after main power OFF), otherwise it may cause electrical shock.**

2.5 Other

Electrolytic capacitor and resistor for voltage distribution

1) Disconnect an terminal of voltage distribution resistor from each DC link electrolytic capacitor
2) Set the multi meter to resistance mode, connect the probe to +,- terminal of the capacitor. If the estimated resistance value is increase continuously without short(value is 0), then the resistor is normal
3) Set the multi meter to resistance mode, confirm that the resistance value of the resistor is around 270 kOhm

Check and replace inferior components

Caution **In case that the control box is opened and before checking electrical parts, it should be checked that the LED 01Y (in inverter board, refer to page 172) turned off (wait 3 minutes after main power OFF), otherwise it may cause electrical shock.**

3. Self-diagnosis function

Error Indicator

- The function is to self-diagnose airconditioner and indicate the problems, if any.
- Error mark is displayed on display window of indoor units and wired remote controller, and 7-segment LED of outdoor unit control board as shown in the table.
- If more than two troubles occur simultaneously, lower number of error code is first displayed.
- After error occurrence, if error is released, error LED is also released simultaneously.

	Display		Title	Cause of Error
Indoor unit related error	0	1	Indoor unit air sensor	Indoor unit air sensor open or short
	0	2	Indoor unit sensor(inlet pipe)	Indoor unit inlet pipe sensor open or short
	0	3	Wired remote control ↔ indoor unit transmission	In the case that indoor unit can not receive any signal from wired remote control successively for 3 minutes
	0	4	Drain pump	Malfunction of drain pump
	0	5	Outdoor unit ↔ indoor unit transmission	In the case that indoor unit can not receive any signal from outdoor unit successively for 3 minutes
	0	6	Indoor unit outlet pipe sensor	Indoor unit outlet pipe sensor open or short
	0	7	The other operation mode	In the case that an indoor unit is operated the other operation mode different from the operated indoor unit
	0	8	Not in use	Not in use
	0	9	Serial No. Error	In the case that the serial number marked on EEPROM of indoor unit is 0 or FFFFFF
Power related error	2	1	DC peak	IPM over temperature or compressor malfunction is occurred 3 times in 1 hour
	2	2	Max CT	When current detection is over the maximum current limit
	2	3	DC link	DC charging is not performed for 45 sec after starting relay turn on
	2	4	High pressure	Compressor is OFF 3 times in 1 hour due to high pressure
	2	5	Low/Over voltage	Input voltage is out of tolerance of rating voltage
Compressor related error	3	1	Not in use	Not in use
	3	2	Discharge temperature (inverter compressor)	Due to over rising of inverter compressor discharge temperature, Compressor off is occurred 3 times in 1 hour
	3	3	Discharge temperature (constant speed compressor)	Due to over rising of constant speed compressor discharge temperature, Compressor off is occurred 3 times in 1 hour
	3	4	High pressure	Due to high pressure, Compressor off is occurred 3 times in 1 hour
	3	5	Low pressure	Due to low pressure, Compressor off is occurred 3 times in 1 hour

■ Error code 52, 53, 54, 56, 57 are applied only to CRUN1008T0

	Display		Title	Cause of Error
Outdoor unit related error	4	0	CT sensor	CT sensor open or short
	4	1	Inverter compressor discharge pipe sensor (discharge temperature)	Inverter compressor dischare pipe sensor open or short
	4	2	Low pressure sensor	Low pressure sensor open or short
	4	3	High pressure sensor	High pressure sensor open or short
	4	4	Outdoor air sensor	Outdoor unit air sensor open or short
	4	5	Outdoor unit pipe sensor	Outdoor unit pipe sensor(left) open or short
	4	6	Suction pipe sensor	Duction pipe sensor open or short
	4	7	Normal compressor discharge pipe	Normal compressor discharge pipe sensor open or short
	4	8	Outdoor unit pipe sensor	Outdoor unit pipe sensor (right) open or short
	4	9	Voltage sensor	Voltage sensor open or short
Transmission related error	5	1	Indoor connection over(capacity)	The displayed number of indoor units being connected is over rated capacity of outdoor unit
	5	2	Transmission error from inverter PCB to main PCB in the outdoor unit	In the case that main PCB can not receive any signal from inverter PCB successively for 20 seconds
	5	3	Transmission error from indoor unit to main PCB in the outdoor unit	In the case that main PCB can not receive any signal-from indoor unit successively for 3minutes
	5	4	Reverse connection of the R,S,T power line	Misconnection or disconnection of R,S,T power line
	5	5	Transmission error from central control to main PCB in the outdoor unit	In the case that main PCB can not receive any signal from central control successively for 3minutes
	5	6	Transmission error from main PCB in the outdoor unit to central control	In the case that central control can not receive any signal from main PCB successively for 3minutes
	5	7	Transmission error from main PCB to inverter PCB in the outdoor unit	In the case that inverter PCB can not receive any signal from main PCB successively for 20 seconds

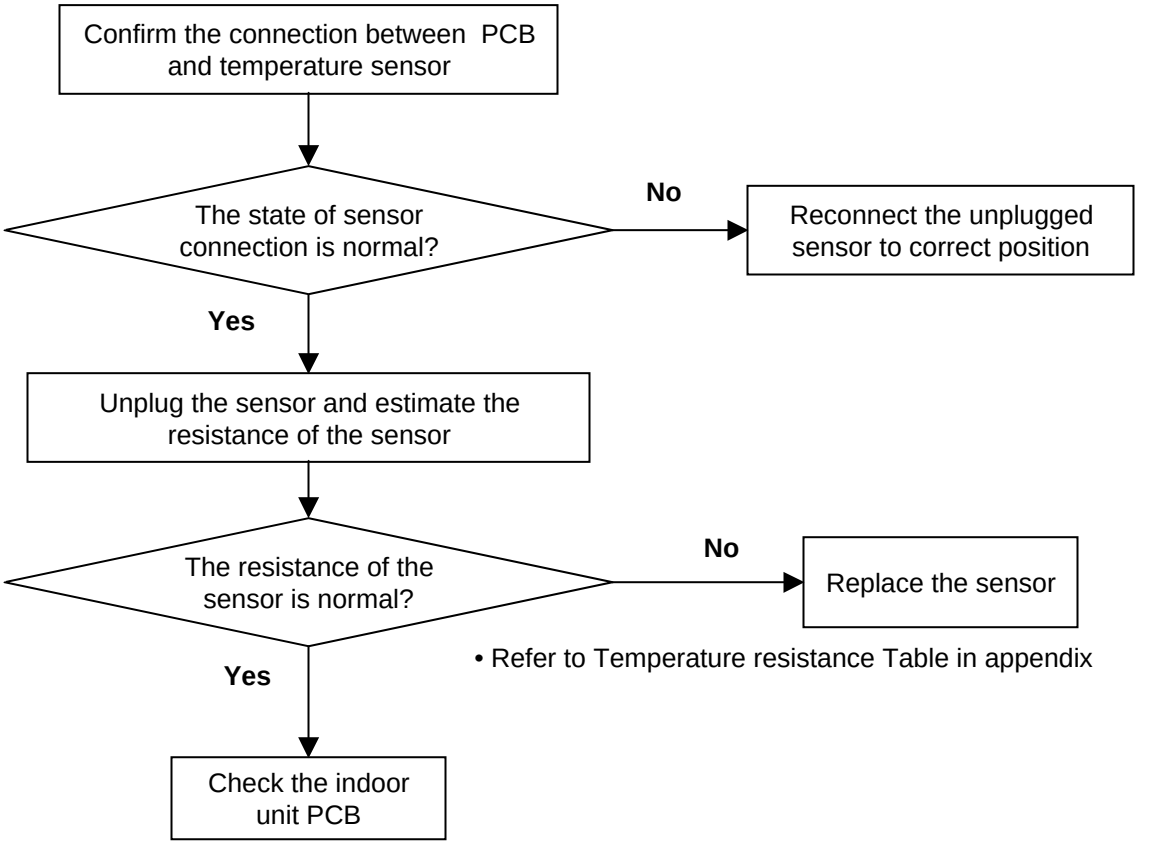
■ **Please refer to trouble shooting guide in service manual for each error title**

⚠ Caution **In case that the control box is opened and before checking electrical parts, it should be checked that the LED 01Y (Refer to next page) turned off (wait 3 minutes after main power OFF), otherwise it may cause electrical shock.**

Fault diagnosis and Trouble shooting guide

Display code	Title	Meaning	Cause of error
01	Indoor unit sensor(air)	It is occurred that the temperature sensor may detect abnormal value	• The temperature sensor unplugged • The sensor may be open or short • Indoor unit PCB may be poor
02	Indoor unit sensor (inlet pipe)		
06	Indoor unit sensor (outlet pipe)		

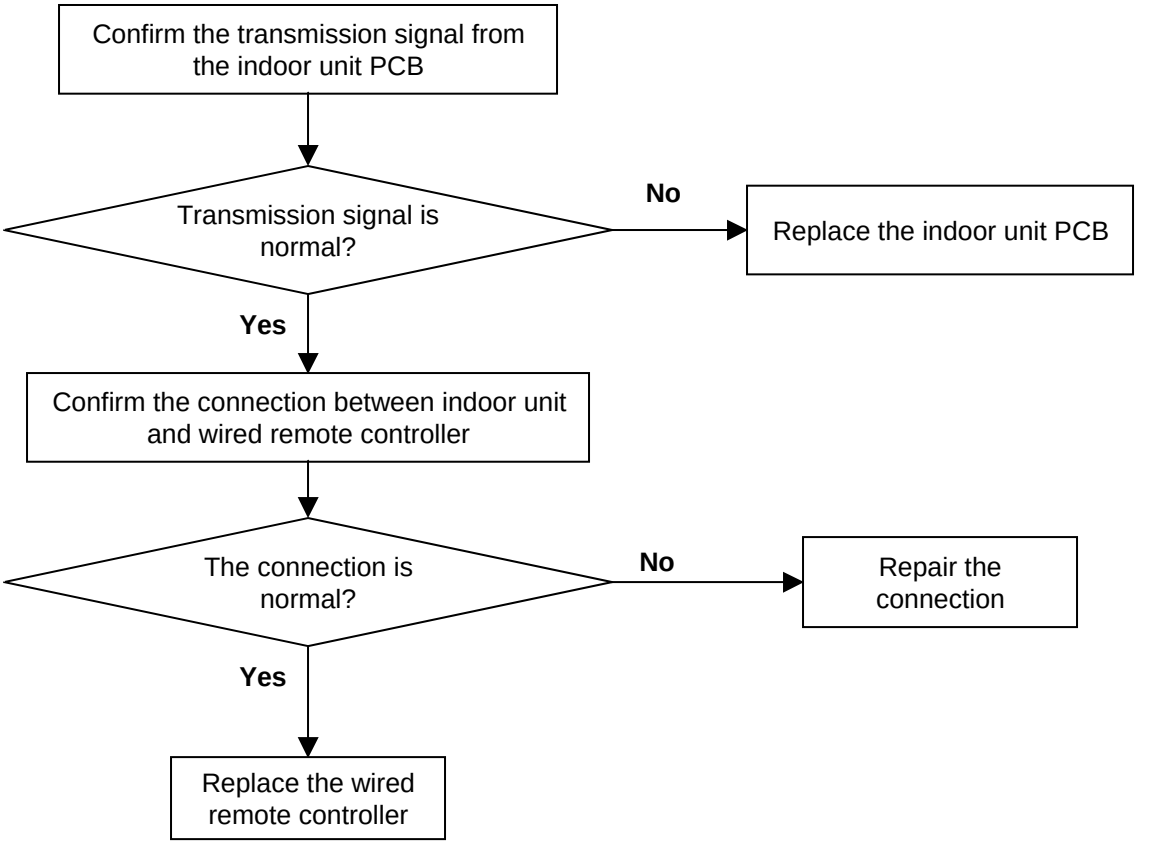
Trouble shooting Flow


Confirm the connection between PCB and temperature sensor
The state of sensor connection is normal?
No
Reconnect the unplugged sensor to correct position
Yes
Unplug the sensor and estimate the resistance of the sensor
The resistance of the sensor is normal?
No
Replace the sensor
• Refer to Temperature resistance Table in appendix
Yes
Check the indoor unit PCB

Fault diagnosis and Trouble shooting guide

Display code	Title	Meaning	Cause of error
03	Wired remote controller ↔ indoor unit transmission error	In the case that indoor unit can not receive any signal from wired remote controller successively for 3minutes	• Wired remote controller PCB may be poor • Indoor unit PCB may be poor • Defection of connection

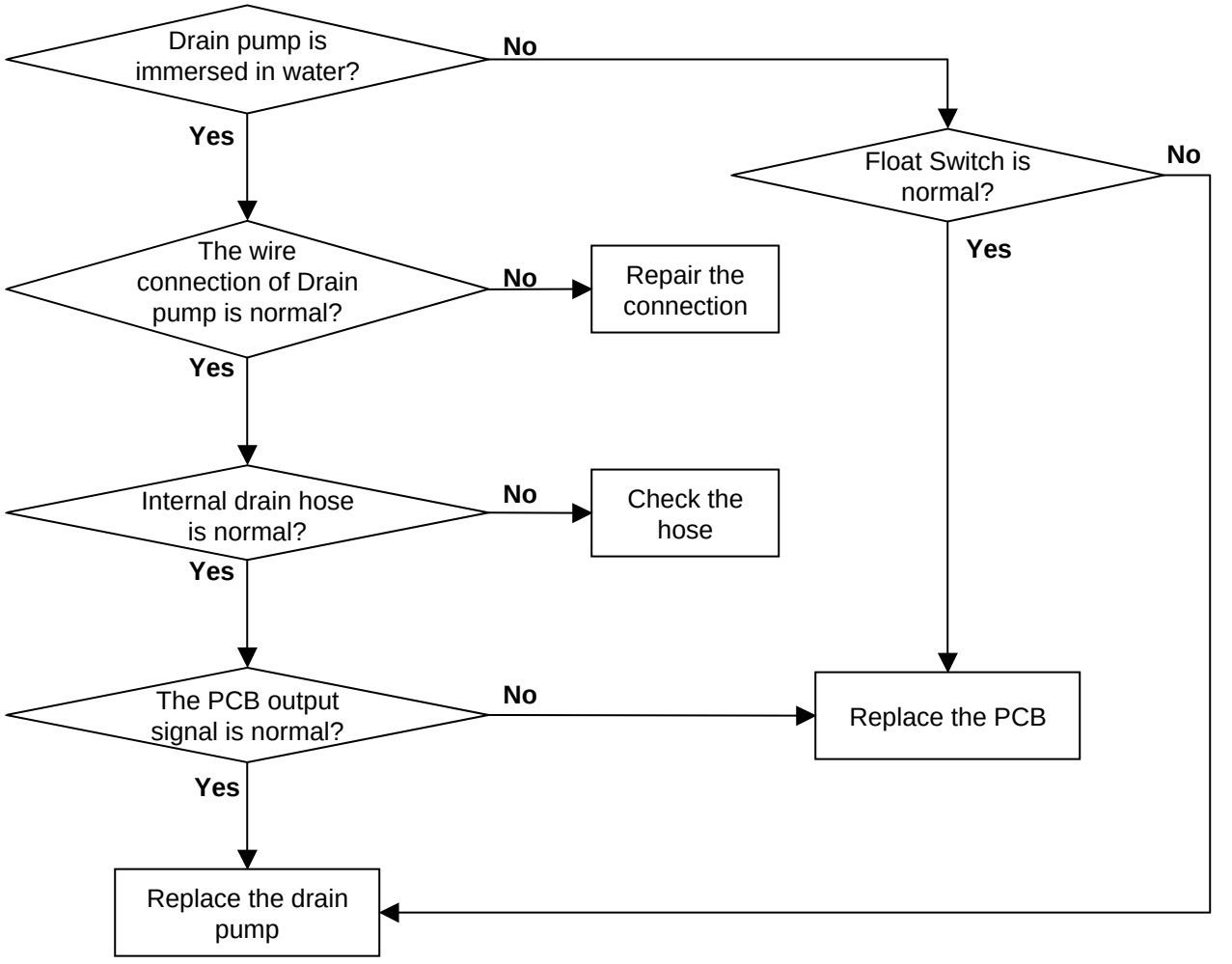
Trouble shooting Flow


Confirm the transmission signal from the indoor unit PCB
Transmission signal is normal?
No
Replace the indoor unit PCB
Yes
Confirm the connection between indoor unit and wired remote controller
The connection is normal?
No
Repair the connection
Yes
Replace the wired remote controller

Fault diagnosis and Trouble shooting guide

Display code	Title	Meaning	Cause of error
04	Fault of drain pump	Although operation signal of drain pump is occurred, the float switch send full signal	• Malfunction of float switch of drain pump • Malfunction of drain pump • Indoor unit PCB may be poor

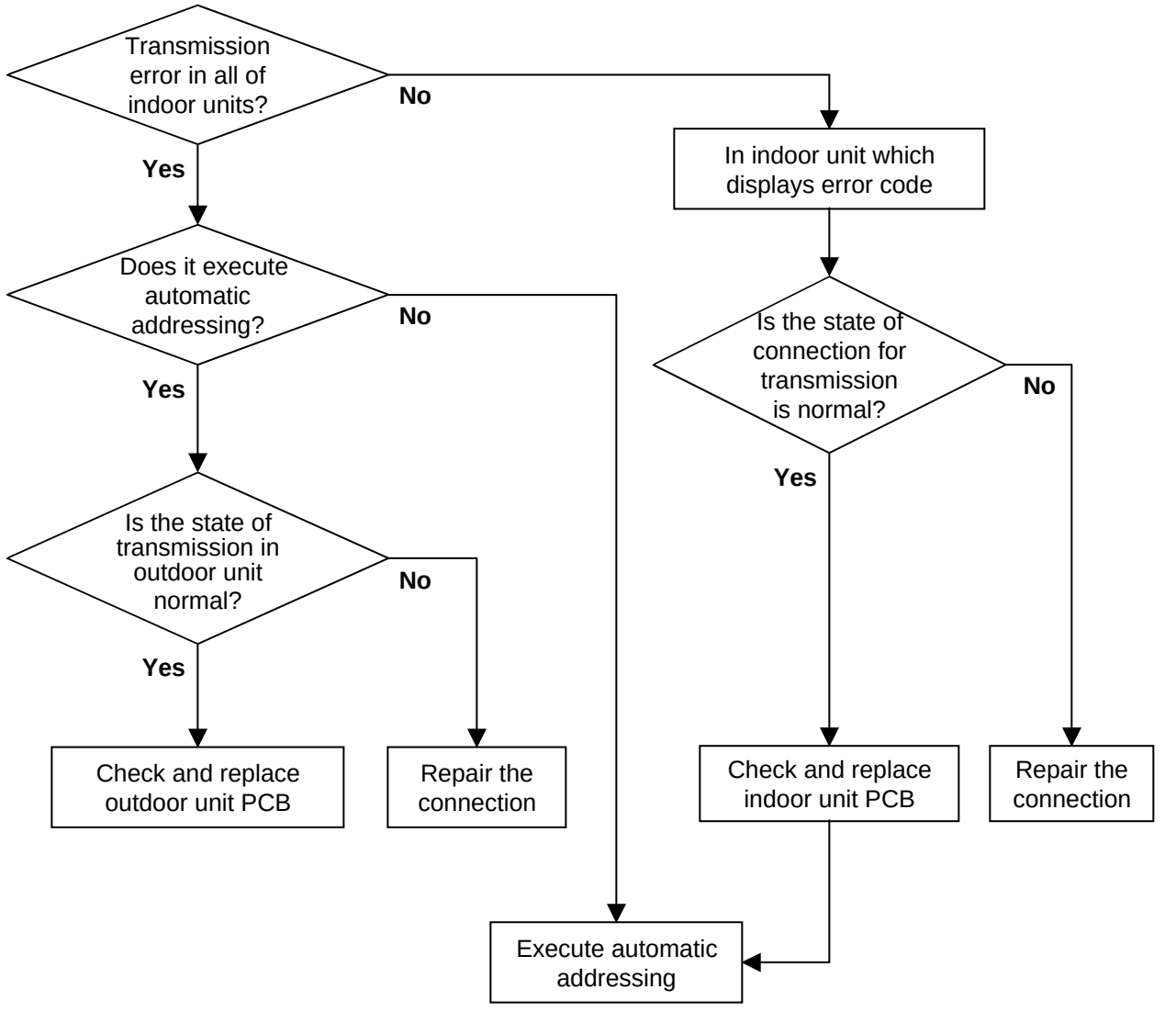
Trouble shooting Flow



Fault diagnosis and Trouble shooting guide

Display code	Title	Meaning	Cause of error
05	Outdoor unit ↔ indoor unit transmission error	In the case that indoor unit can not receive any signal from outdoor unit successively for 3minutes	• Automatic addressing problem. • Unplugging of transmission connector • Misconnection or open of transmission cable • Malfunction of indoor unit transmission circuit • Malfunction of outdoor unit transmission circuit • The distance between power cable and transmission cable is not enough.

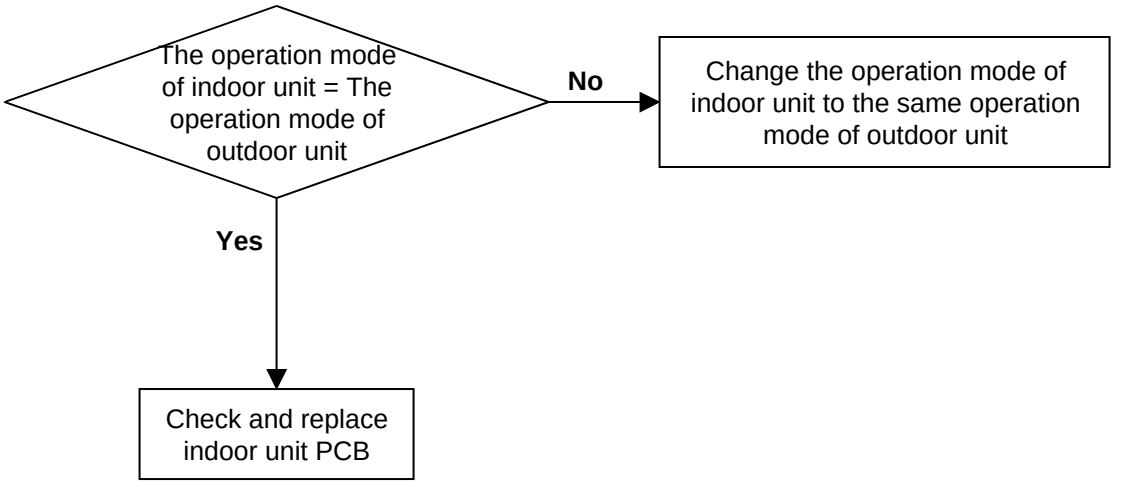
Trouble shooting Flow



Fault diagnosis and Trouble shooting guide

Display code	Title	Meaning	Cause of error
07	Different operation mode	All indoor units are not operating in the same mode. This indoor unit is in different mode than other units.	• Example: When one or more indoor units are operated in cooling mode, if an indoor unit which is off state is to operate heating mode, press operation key in the remote controller then this error occurs.

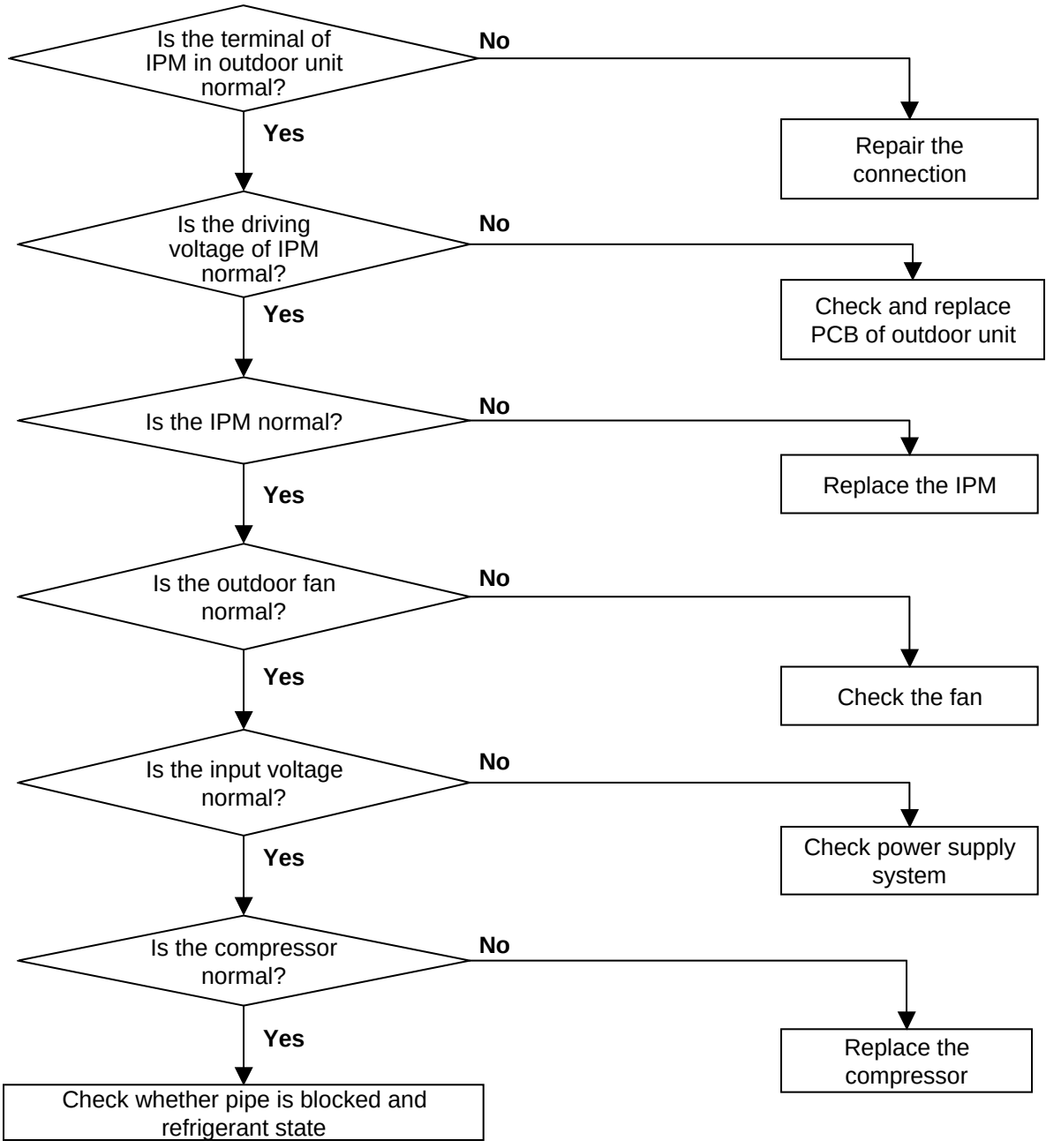
Trouble shooting Flow


The operation mode of indoor unit = The operation mode of outdoor unit
No
Change the operation mode of indoor unit to the same operation mode of outdoor unit
Yes
Check and replace indoor unit PCB

Fault diagnosis and Trouble shooting guide

Display code	Title	Meaning	Cause of error
21	DC Peak	The protection operation of inverter compressor driving device(IPM) for over current flow into the IPM	• An instant over current in the U,V,W phase of compressor • Overheat of IPM for malfunction of heat radiation • Overcharging of refrigerant • Poor insulation of compressor • Low voltage input • Damage of compressor motor coil.

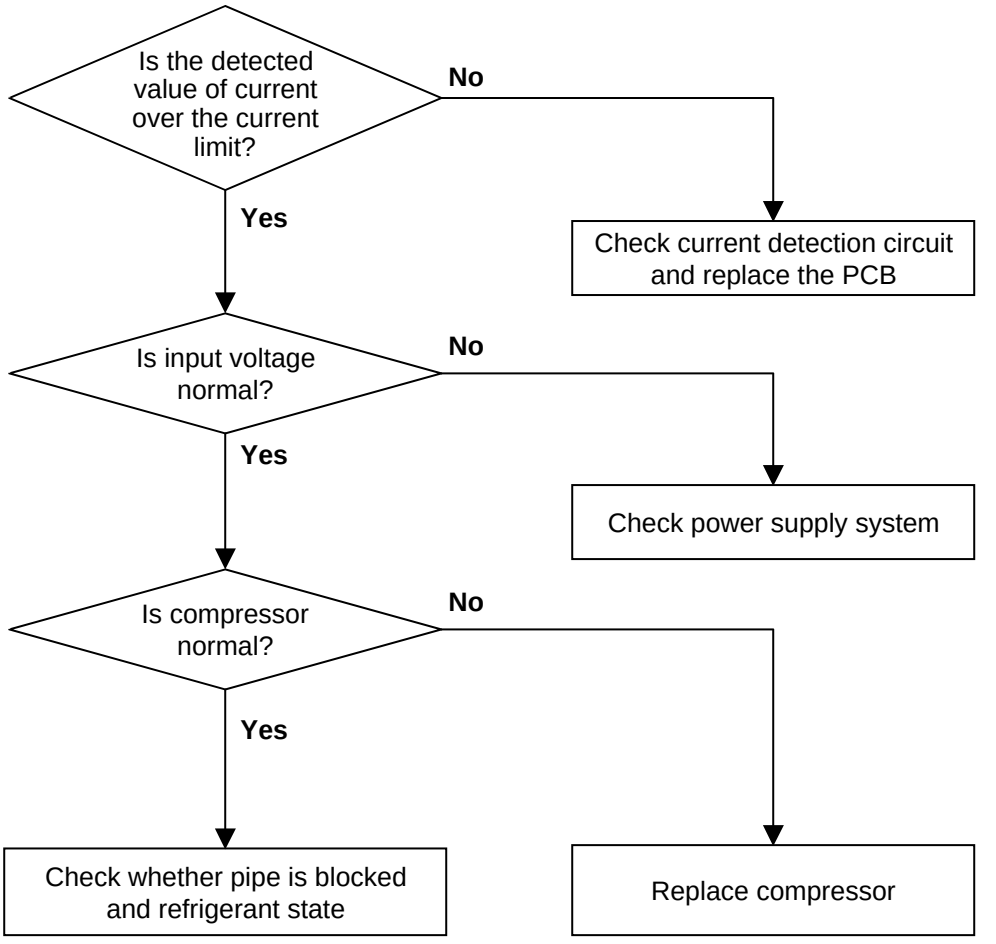
Trouble shooting Flow



Fault diagnosis and Trouble shooting guide

Display code	Title	Meaning	Cause of error
22	Max CT	When current detection is over the maximum current limit	• Malfunction of compressor • Blocking of pipe • Malfunction of current detection circuit • Low voltage input

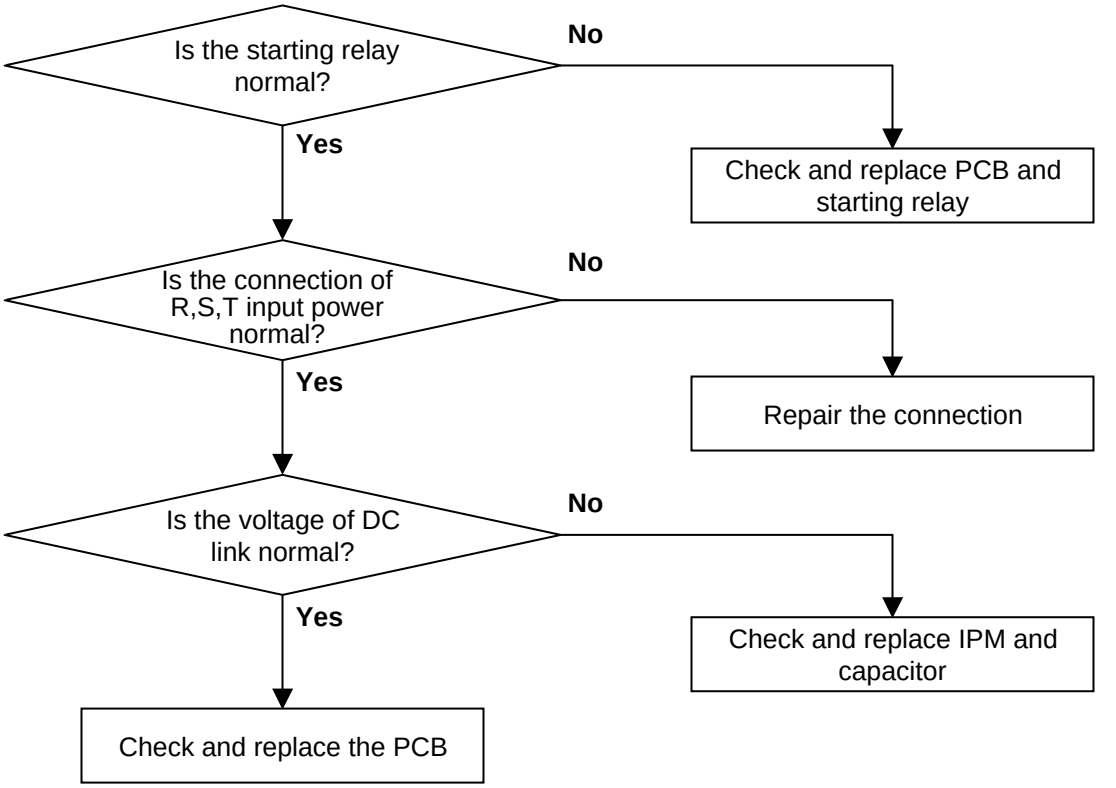
Trouble shooting Flow



Fault diagnosis and Trouble shooting guide

Display code	Title	Meaning	Cause of error
23	DC link	DC charging is not performed for 45 sec. after starting relay turn on (initial charging is under 320VDC)	• Poor connection on DC link terminal • Malfunction of starting relay • Malfunction of capacitor • Abnormal in R,S,T connection • Malfunction of IPM • Malfunction of detection PCB

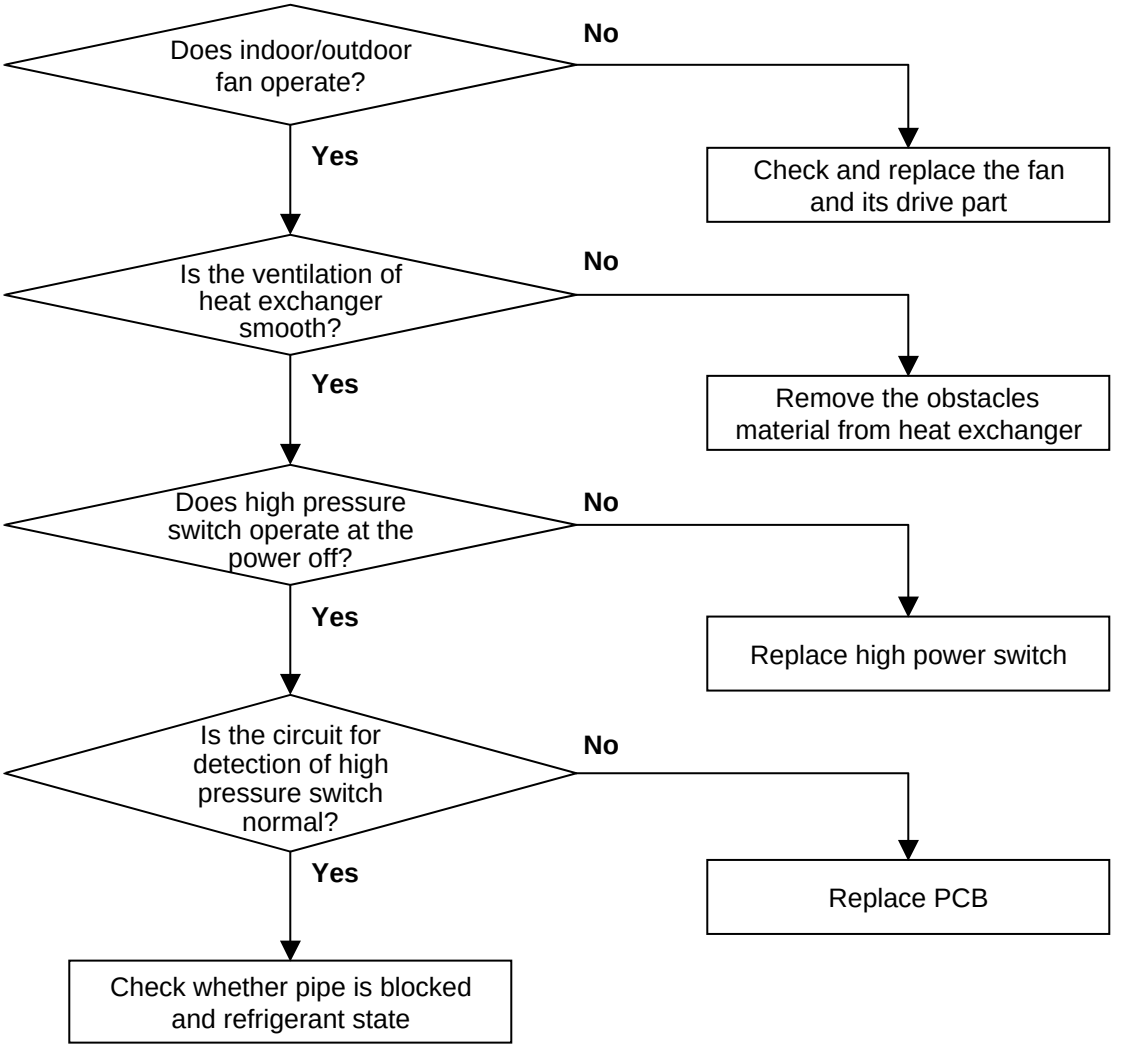
Trouble shooting Flow



Fault diagnosis and Trouble shooting guide

Display code	Title	Meaning	Cause of error
24	High pressure	Compressor off has occurred 3 times in1 hour	• Malfunction of high pressure switch • Fan lock of indoor or outdoor unit • Obstacles of indoor or outdoor heat exchanger • Blocking in discharge pipe of compressor

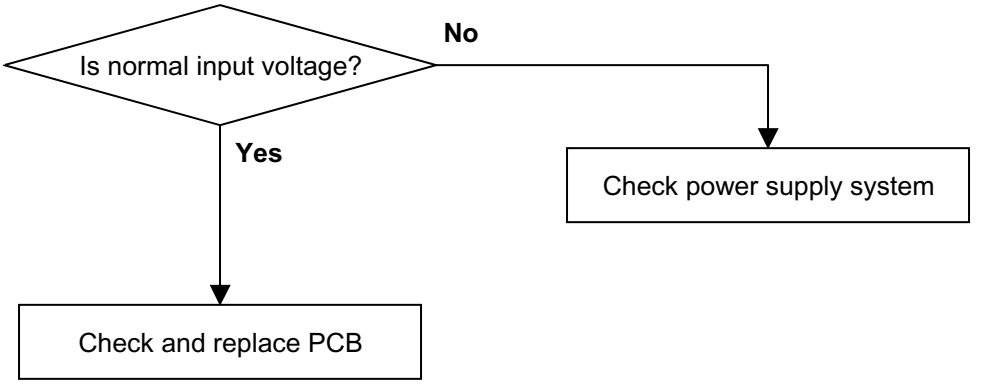
Trouble shooting Flow


Does indoor/outdoor fan operate?
No
Check and replace the fan and its drive part
Yes
Is the ventilation of heat exchanger smooth?
No
Remove the obstacles material from heat exchanger
Yes
Does high pressure switch operate at the power off?
No
Replace high power switch
Yes
Is the circuit for detection of high pressure switch normal?
No
Replace PCB
Yes
Check whether pipe is blocked and refrigerant state

Fault diagnosis and Trouble shooting guide

Display code	Title	Meaning	Cause of error
25	Low / over voltage	Input voltage is out of tolerance of rating voltage	• Abnormal of Input power voltage • Malfunction of circuit for detection of voltage

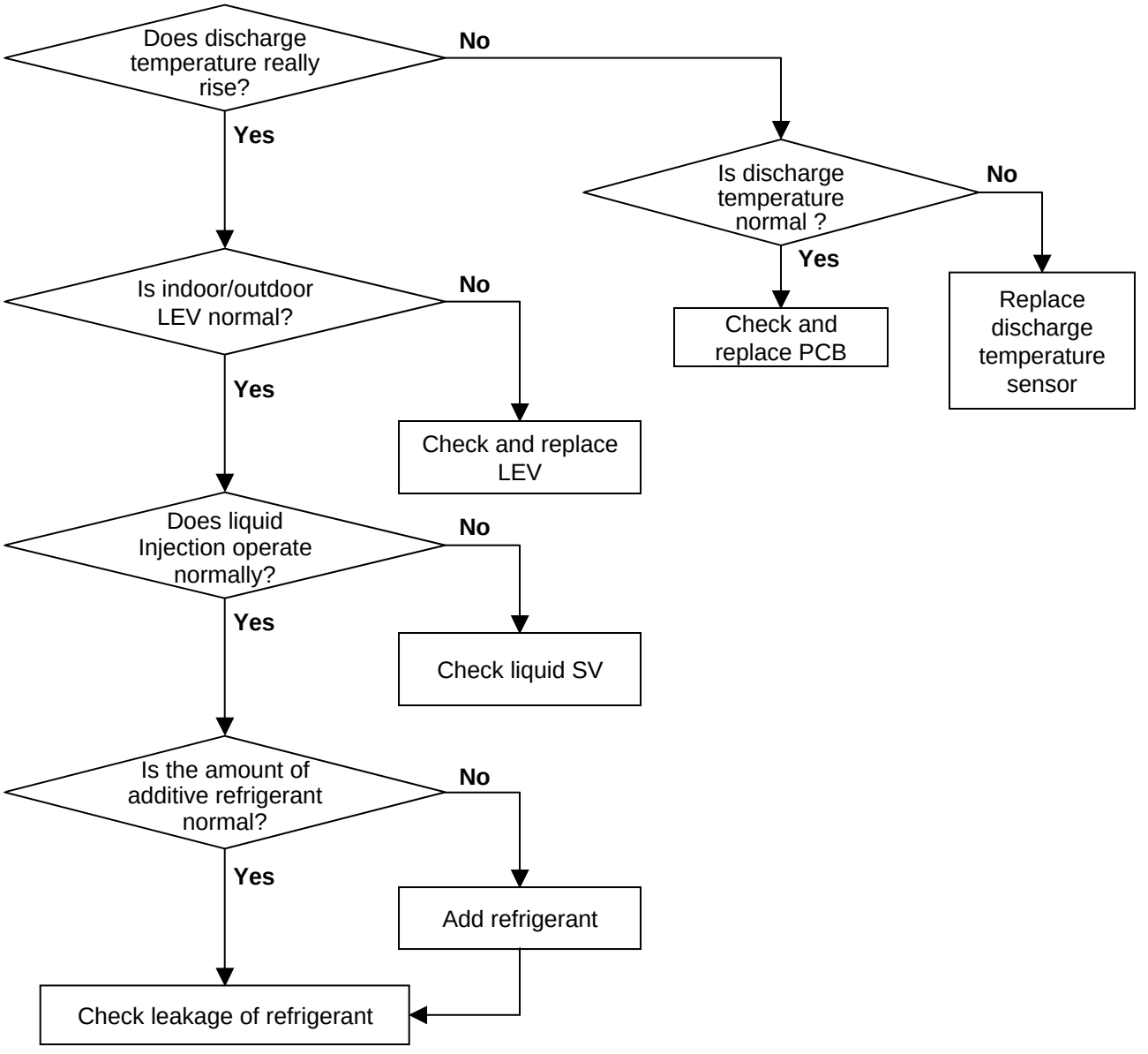
Trouble shooting Flow



Fault diagnosis and Trouble shooting guide

Display code	Title	Meaning	Cause of error
32	Discharge temperature (inverter compressor)	Due to over rising of inverter compressor discharge temperature, Compressor off has occurred 3 times in 1 hour	• Abnormal of sensor for detecting temperature of discharge gas from compressor • Malfunction of circuit for detection of temperature of discharge gas from compressor • Shortage of refrigerant • Malfunction of LEV

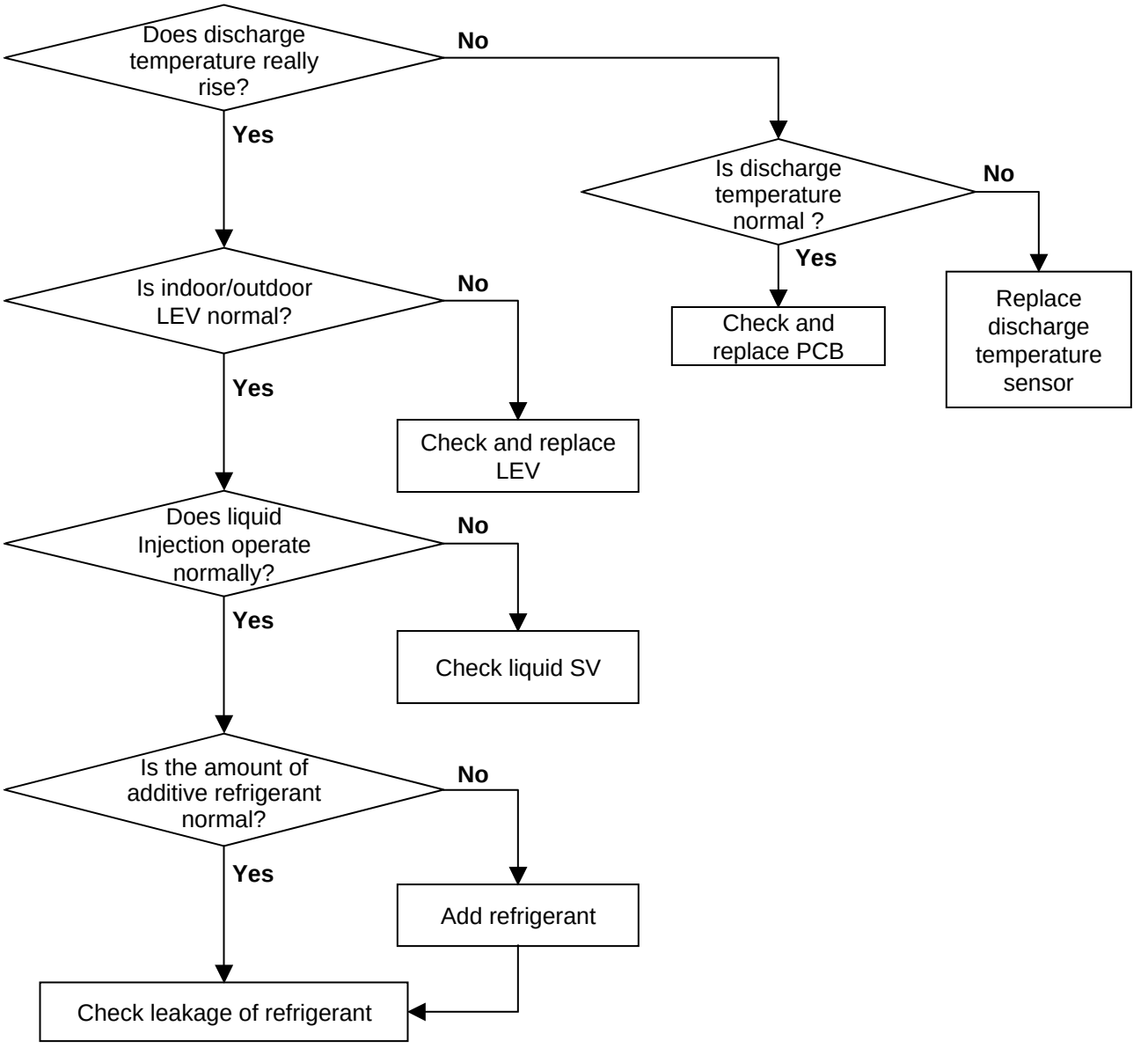
Trouble shooting Flow



Fault diagnosis and Trouble shooting guide

Display code	Title	Meaning	Cause of error
33	Discharge temperature (constant speed compressor)	Due to over rising of constant speed compressor discharge temperature, Compressor off has occurred 3 times in 1 hour	• Abnormal of sensor for detecting temperature of discharge gas from compressor • Malfunction of circuit for detection of temperature of discharge gas from compressor • Shortage of refrigerant • Malfunction of LEV

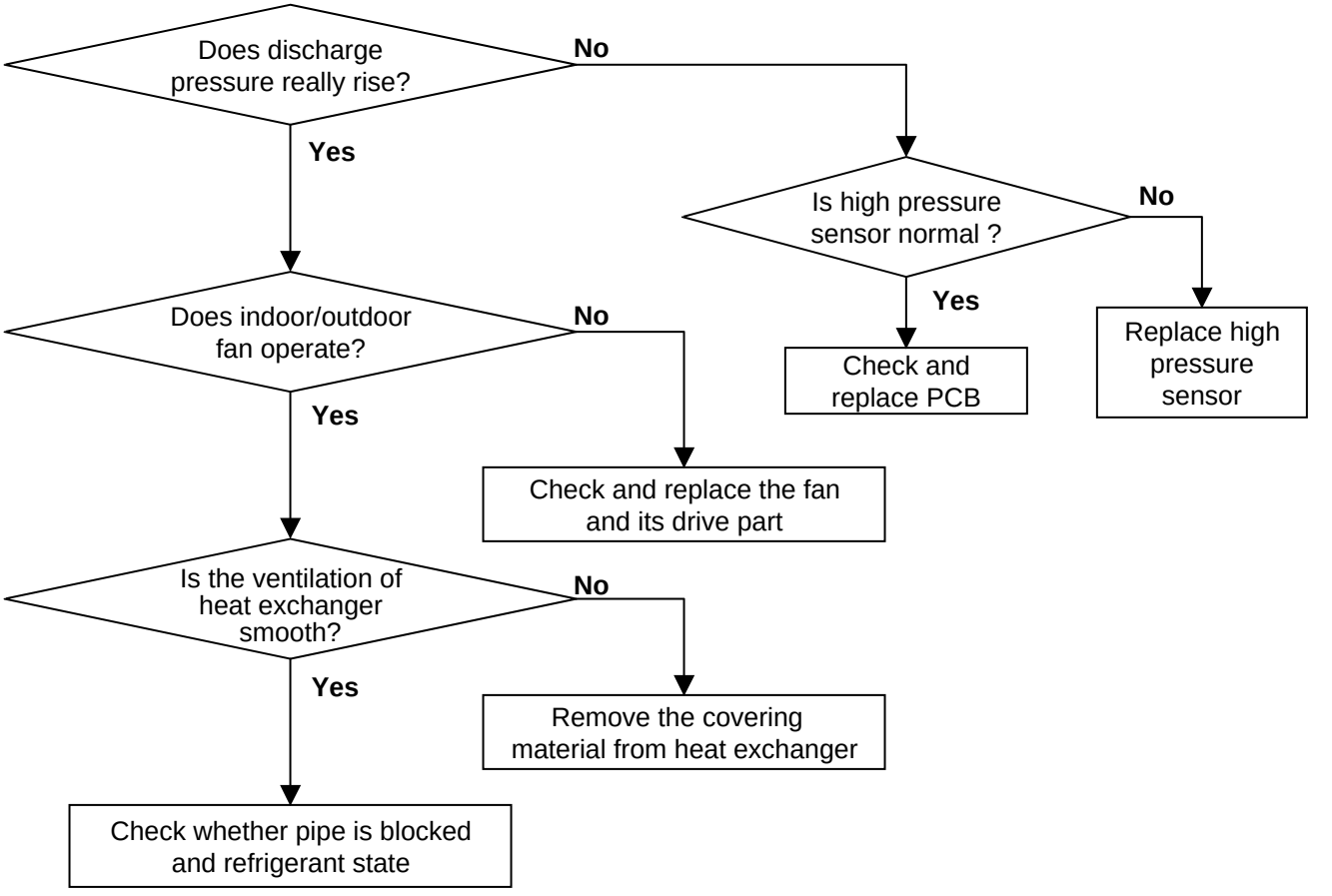
Trouble shooting Flow



Fault diagnosis and Trouble shooting guide

Display code	Title	Meaning	Cause of error
34	High pressure	Due to high pressure, Compressor off has occurred 3 times in1 hour The discharge pressure of compressor is over the limit	• Malfunction of high pressure sensor • Fan lock of indoor or outdoor unit • Covering of indoor or outdoor heat exchanger • Blocking in discharge pipe of compressor

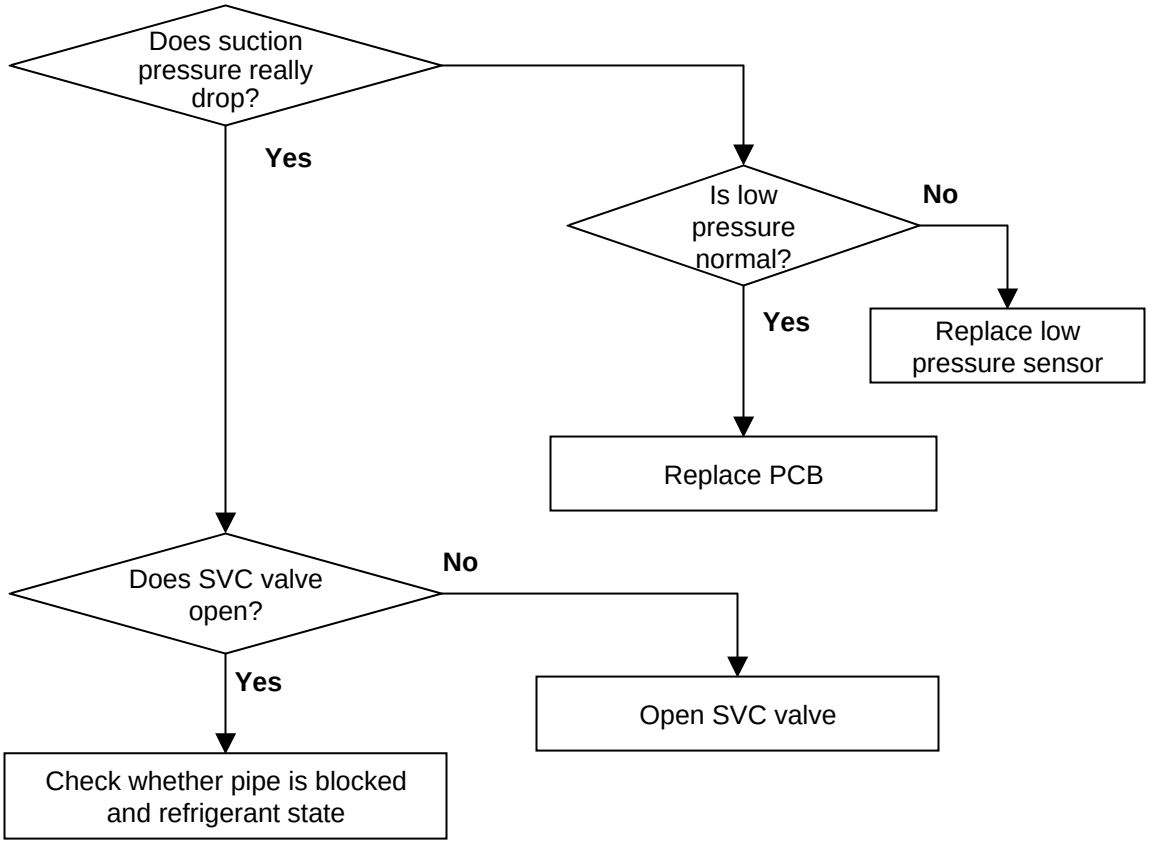
Trouble shooting Flow



Fault diagnosis and Trouble shooting guide

Display code	Title	Meaning	Cause of error
35	Low pressure	Compressor off has occurred 3 times in1 hour The suction pressure of compressor is under the limit	• Abnormal of sensor for detecting pressure of suction pipe of compressor • Malfunction of circuit for detecting pressure of suction pipe of compressor • Closing of SVC valve • Shortage of refrigerant

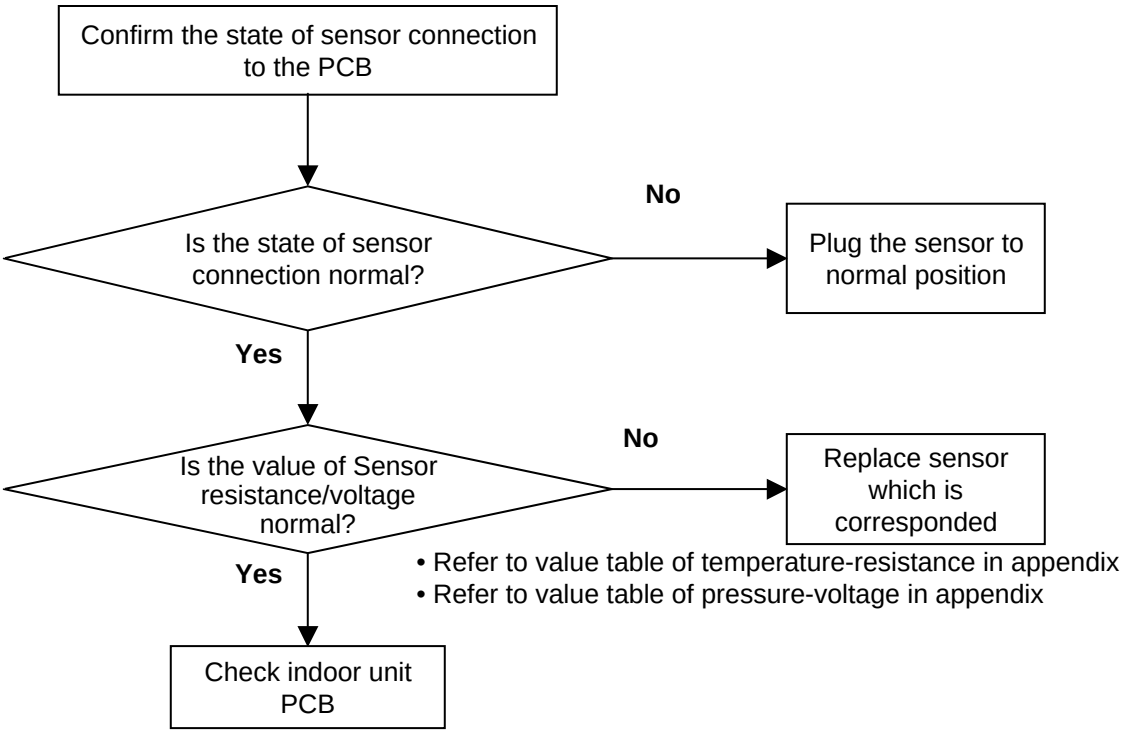
Trouble shooting Flow



Fault diagnosis and Trouble shooting guide

Display code	Title	Meaning	Cause of error
40, 41, 42, 43, 44, 45, 46, 47, 48, 49	Sensor error	Sensor detects abnormal value	•The temperature sensor is unplugged •The sensor is open or short by its inferiority •PCB inferiority

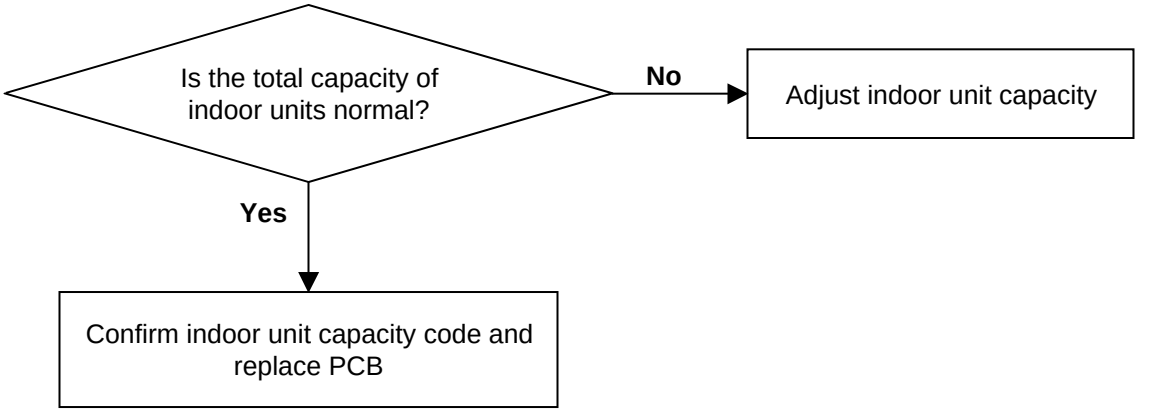
Trouble shooting Flow


Confirm the state of sensor connection to the PCB
Is the state of sensor connection normal?
No
Plug the sensor to normal position
Yes
Is the value of Sensor resistance/voltage normal?
No
Replace sensor which is corresponded
Yes
• Refer to value table of temperature-resistance in appendix
• Refer to value table of pressure-voltage in appendix
Check indoor unit PCB

Fault diagnosis and Trouble shooting guide

Display code	Title	Meaning	Cause of error
51	Indoor connection over(capacity)	The total capacity of indoor units being connected is over rated capacity of outdoor unit by 130% (10HP), 115% (4.5HP) 120% (6HP)	• Over connection to outdoor unit capacity • Malfunction of indoor unit capacity code

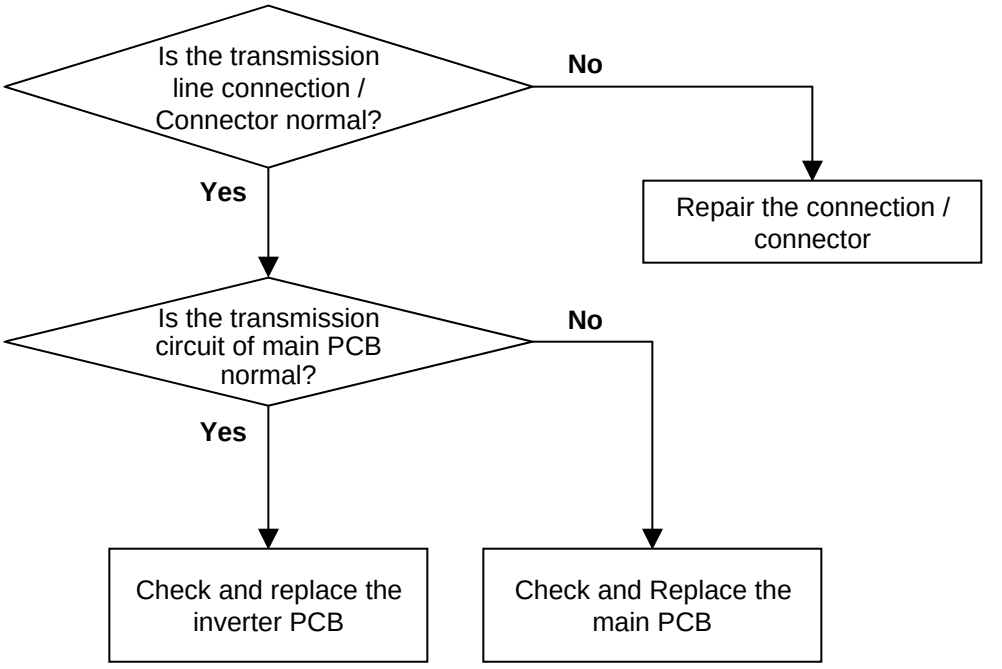
Trouble shooting Flow


Is the total capacity of indoor units normal?
No
Adjust indoor unit capacity
Yes
Confirm indoor unit capacity code and replace PCB

Fault diagnosis and Trouble shooting guide

Display code	Title	Meaning	Cause of error
52	Transmission error from inverter PCB to main PCB in the outdoor unit	In the case that main PCB can not receive any signal from inverter PCB successively for 20 seconds	• The connector for transmission disconnected • The transmission line is misconnected or shorted • Transmission circuit of main PCB is abnormal • Transmission circuit of inverter PCB is abnormal

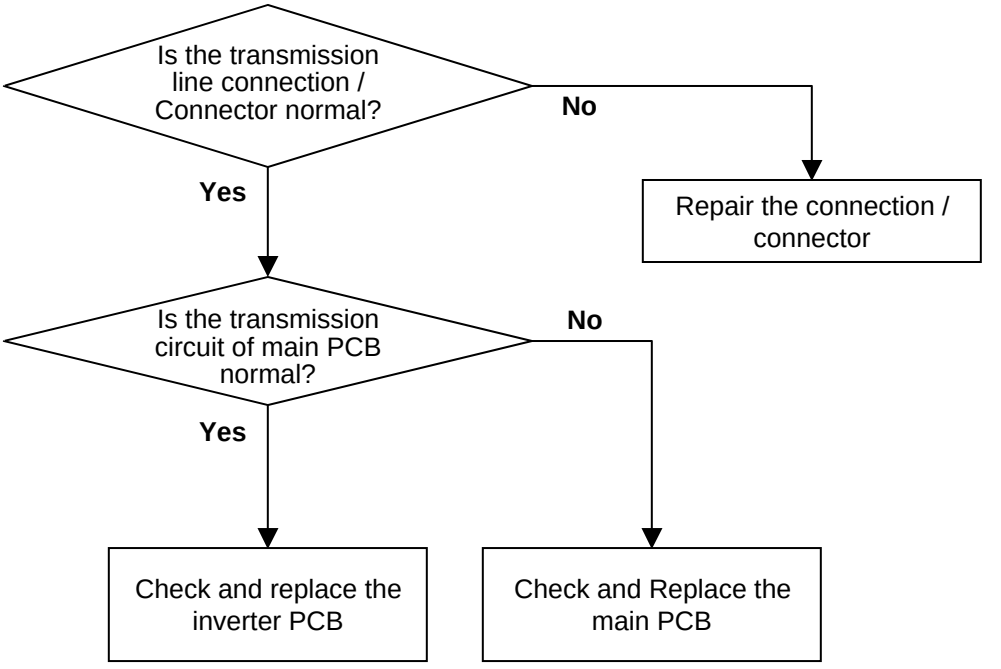
Trouble shooting Flow


Is the transmission line connection / Connector normal?
No
Repair the connection / connector
Yes
Is the transmission circuit of main PCB normal?
No
Yes
Check and replace the inverter PCB
Check and Replace the main PCB

Fault diagnosis and Trouble shooting guide

Display code	Title	Meaning	Cause of error
53	Transmission error from indoor unit to main PCB in the outdoor unit	In the case that main PCB can not receive any signal from indoor unit successively for 3minutes	• The connector for transmission disconnected • The transmission line is misconnected or shorted • Transmission circuit of main PCB is abnormal • Transmission circuit of indoor unit PCB is abnormal

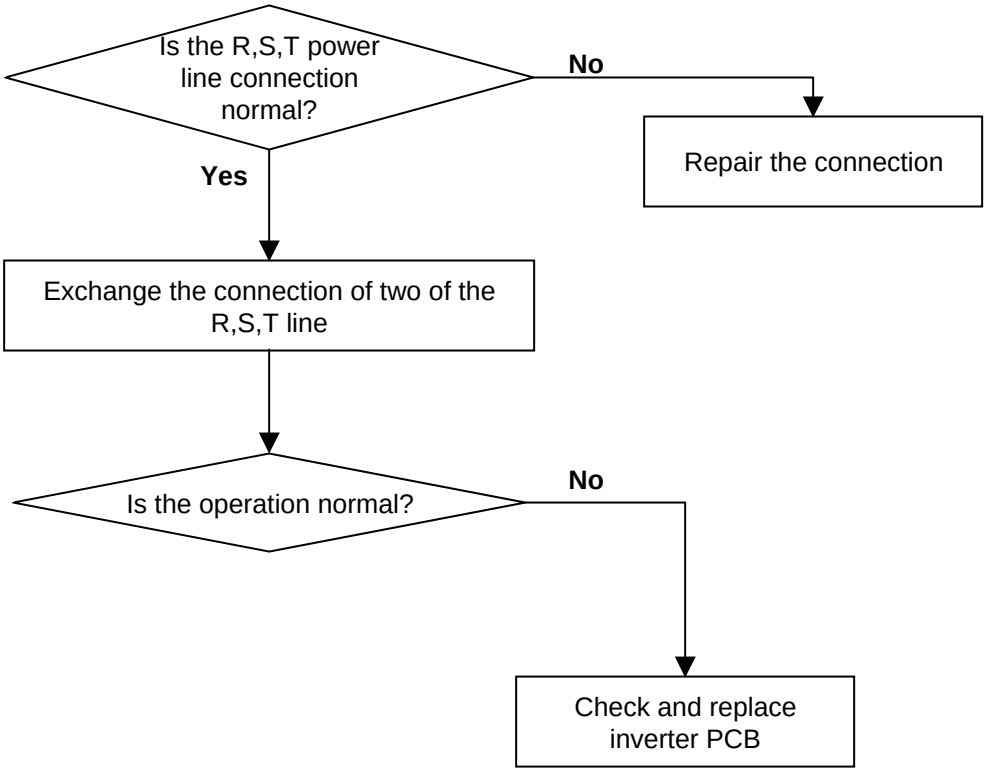
Trouble shooting Flow


Is the transmission line connection / Connector normal?
No
Repair the connection / connector
Yes
Is the transmission circuit of main PCB normal?
No
Yes
Check and replace the inverter PCB
Check and Replace the main PCB

Fault diagnosis and Trouble shooting guide

Display code	Title	Meaning	Cause of error
54	Reverse connection of R,S,T power line		• Inverter PCB is abnormal • One of the R,S,T line is disconnected • Connection order of R,S,T line is changed

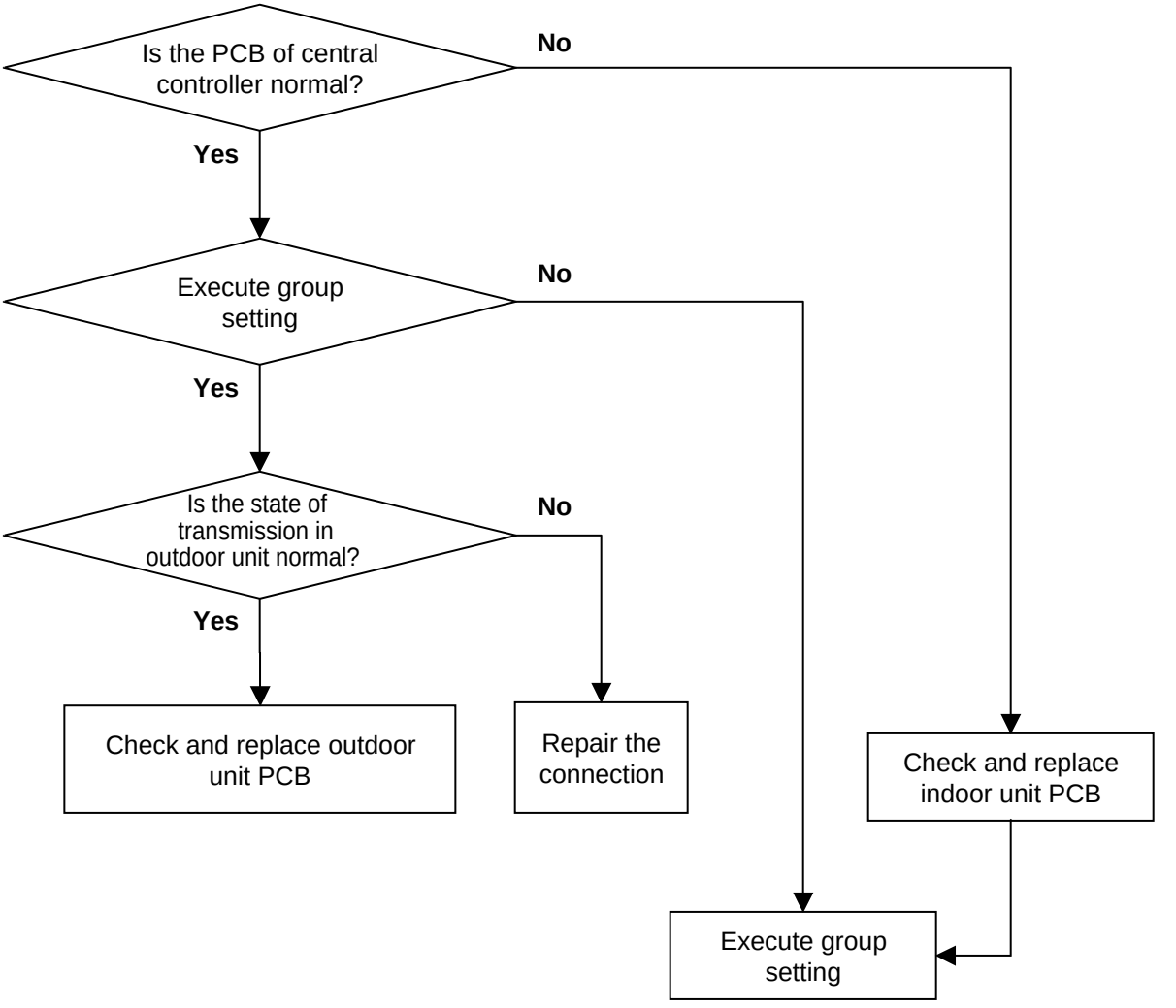
Trouble shooting Flow



Fault diagnosis and Trouble shooting guide

Display code	Title	Meaning	Cause of error
55	Transmission error from central controller to main PCB in the outdoor unit	In the case that main PCB can not receive any signal from central controller successively for 3minutes	• Group setting is not carried out • Transmission connector unplugged • Transmission cable misconnected / disconnection • Malfunction of central controller circuit • Malfunction of transmission circuit of indoor unit

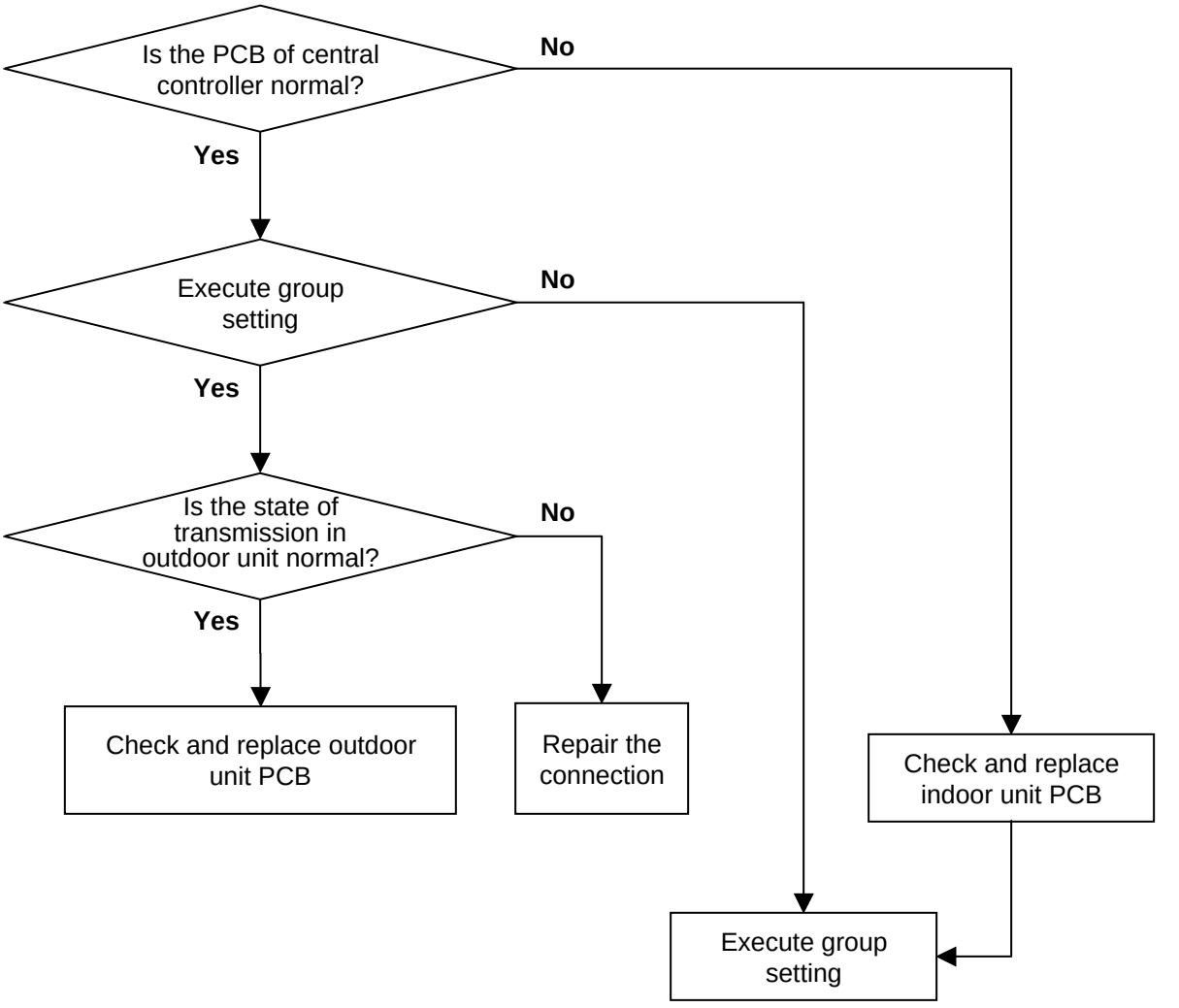
Trouble shooting Flow



Fault diagnosis and Trouble shooting guide

Display code	Title	Meaning	Cause of error
56	Transmission error from main PCB in the outdoor unit to central controller	In the case that central controller can not receive any signal from main PCB successively for 3minutes	• Group setting is not carried out • Transmission connector unplugged • Transmission cable misconnected / disconnection • Malfunction of central controller circuit • Malfunction of transmission circuit of indoor unit • Distance between transmission cable and power cable is not enough

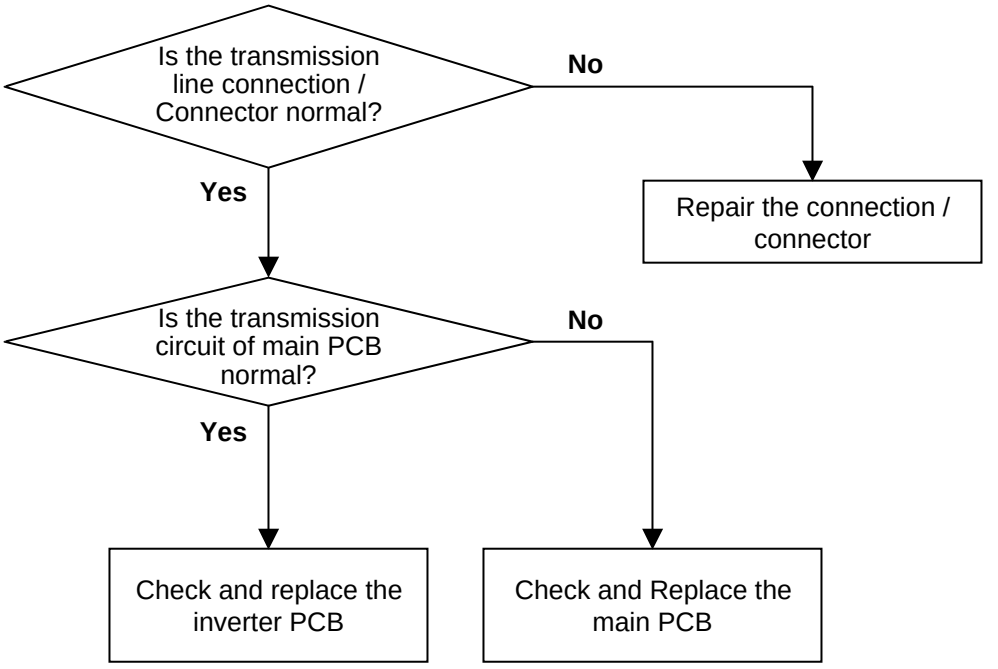
Trouble shooting Flow



Fault diagnosis and Trouble shooting guide

Display code	Title	Meaning	Cause of error
57	Transmission error from main PCB to inverter PCB in the outdoor unit	In the case that inverter PCB can not receive any signal from main PCB successively for 20 seconds	• The connector for transmission disconnected • The transmission line is misconnected or shorted • Transmission circuit of main PCB is abnormal • Transmission circuit of inverter PCB is abnormal

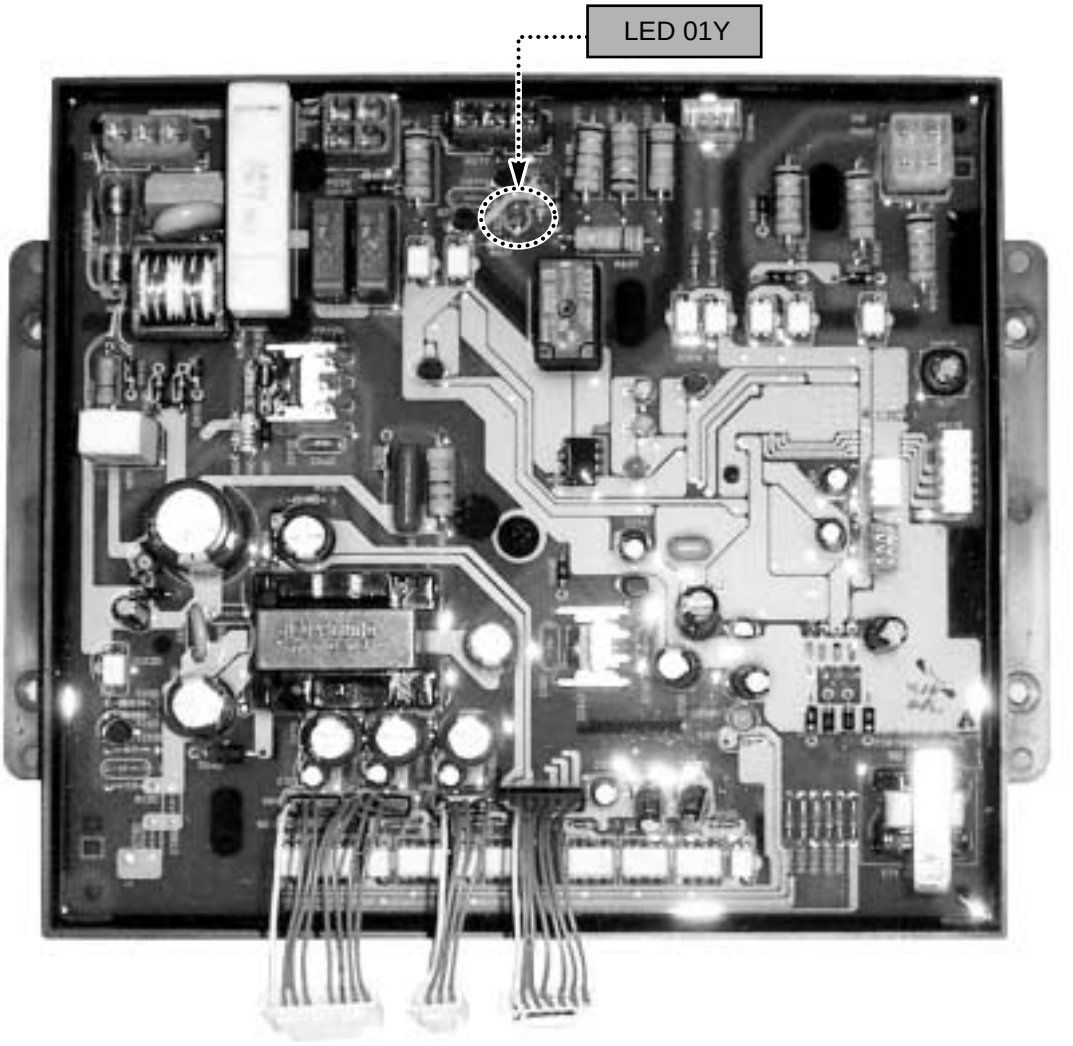
Trouble shooting Flow


Is the transmission line connection / Connector normal?
No
Repair the connection / connector
Yes
Is the transmission circuit of main PCB normal?
No
Yes
Check and replace the inverter PCB
Check and Replace the main PCB

Appendix

Position of the LED01Y in inverter board

CRUN10080T Inverter board



Resistance-Temperature Table

Thermistor: LNTA502HF

T	Rmin	Rcent	Rmax	DR	DT(°C)
-30	79.62	86.91	94.78	9.05%	1.42
-29	75.02	81.79	89.08	8.92%	1.41
-28	70.71	77.00	83.76	8.79%	1.40
-27	66.67	72.51	78.79	8.66%	1.39
-26	62.89	68.31	74.14	8.53%	1.38
-25	59.34	64.38	69.79	8.40%	1.37
-24	56.00	60.69	65.71	8.27%	1.36
-23	52.88	57.24	61.90	8.15%	1.35
-22	49.94	54.00	58.33	8.02%	1.33
-21	47.19	50.96	54.98	7.90%	1.32
-20	44.60	48.11	51.85	7.77%	1.31
-19	42.17	45.43	48.91	7.65%	1.30
-18	39.88	42.92	46.15	7.53%	1.29
-17	37.73	40.56	43.57	7.40%	1.28
-16	35.71	38.35	41.14	7.28%	1.26
-15	33.81	36.26	38.86	7.16%	1.25
-14	32.02	34.30	36.72	7.04%	1.24
-13	30.33	32.46	34.71	6.93%	1.23
-12	28.74	30.73	32.82	6.81%	1.22
-11	27.25	29.10	31.04	6.69%	1.20
-10	25.84	27.56	29.37	6.58%	1.19
-9	24.51	26.11	27.80	6.46%	1.18
-8	23.25	24.75	26.32	6.35%	1.16
-7	22.07	23.47	24.93	6.23%	1.15
-6	20.95	22.26	23.62	6.12%	1.14
-5	19.90	21.12	22.39	6.01%	1.13
-4	18.91	20.04	21.22	5.90%	1.11
-3	17.97	19.02	20.13	5.79%	1.10
-2	17.08	18.07	19.09	5.68%	1.09
-1	16.24	17.16	18.12	5.57%	1.07
0	15.45	16.31	17.20	5.46%	1.06
1	14.70	15.50	16.33	5.36%	1.04
2	13.99	14.74	15.51	5.25%	1.03
3	13.32	14.02	14.74	5.15%	1.02
4	12.68	13.33	14.01	5.04%	1.00
5	12.08	12.69	13.32	4.94%	0.99
6	11.51	12.08	12.66	4.83%	0.97
7	10.97	11.50	12.05	4.73%	0.96
8	10.46	10.96	11.46	4.63%	0.95
9	9.978	10.44	10.91	4.53%	0.93
10	9.518	9.949	10.39	4.43%	0.92

T	Rmin	Rcent	Rmax	DR	DT(°C)
11	9.083	9.484	9.895	4.33%	0.90
12	8.669	9.044	9.427	4.23%	0.89
13	8.277	8.627	8.983	4.13%	0.87
14	7.905	8.231	8.563	4.03%	0.86
15	7.551	7.856	8.165	3.93%	0.84
16	7.216	7.500	7.787	3.84%	0.83
17	6.897	7.161	7.430	3.74%	0.81
18	6.594	6.841	7.090	3.65%	0.80
19	6.306	6.536	6.768	3.55%	0.78
20	6.032	6.246	6.462	3.46%	0.76
21	5.772	5.971	6.172	3.37%	0.75
22	5.524	5.710	5.897	3.27%	0.73
23	5.288	5.461	5.635	3.18%	0.72
24	5.064	5.225	5.386	3.09%	0.70
25	4.850	5.000	5.150	3.00%	0.68
26	4.638	4.786	4.934	3.09%	0.71
27	4.437	4.583	4.728	3.18%	0.73
28	4.246	4.389	4.532	3.27%	0.76
29	4.064	4.204	4.345	3.36%	0.79
30	3.891	4.028	4.167	3.45%	0.81
31	3.726	3.861	3.997	3.53%	0.84
32	3.569	3.701	3.835	3.62%	0.86
33	3.419	3.549	3.681	3.71%	0.89
34	3.277	3.404	3.534	3.79%	0.92
35	3.141	3.266	3.393	3.88%	0.94
36	3.012	3.134	3.258	3.97%	0.97
37	2.888	3.008	3.130	4.05%	1.00
38	2.771	2.888	3.008	4.14%	1.02
39	2.659	2.773	2.890	4.22%	1.05
40	2.552	2.664	2.779	4.31%	1.08
41	2.450	2.559	2.672	4.39%	1.10
42	2.352	2.459	2.569	4.47%	1.13
43	2.259	2.364	2.472	4.55%	1.16
44	2.170	2.273	2.378	4.64%	1.19
45	2.085	2.185	2.289	4.72%	1.22
46	2.004	2.102	2.203	4.80%	1.25
47	1.926	2.022	2.121	4.88%	1.27
48	1.852	1.946	2.042	4.96%	1.30
49	1.781	1.873	1.967	5.04%	1.33
50	1.713	1.803	1.895	5.12%	1.36

T	Rmin	Rcent	Rmax	DR	DT(°C)
51	1.649	1.736	1.826	5.20%	1.39
52	1.587	1.672	1.760	5.28%	1.42
53	1.527	1.610	1.697	5.36%	1.45
54	1.470	1.552	1.636	5.44%	1.48
55	1.416	1.495	1.578	5.52%	1.51
56	1.364	1.441	1.522	5.59%	1.54
57	1.314	1.389	1.468	5.67%	1.57
58	1.266	1.340	1.417	5.75%	1.60
59	1.220	1.292	1.367	5.83%	1.63
60	1.176	1.246	1.320	5.90%	1.66
61	1.134	1.203	1.274	5.98%	1.69
62	1.093	1.161	1.231	6.05%	1.72
63	1.054	1.120	1.189	6.13%	1.76
64	1.017	1.081	1.148	6.20%	1.79
65	0.9815	1.044	1.110	6.28%	1.82
66	0.9472	1.008	1.072	6.35%	1.85
67	0.9143	0.9739	1.037	6.43%	1.88
68	0.8827	0.9409	1.002	6.50%	1.91
69	0.8523	0.9092	0.9689	6.57%	1.95
70	0.8232	0.8787	0.9370	6.64%	1.98
71	0.7951	0.8493	0.9064	6.72%	2.01
72	0.7682	0.8211	0.8768	6.79%	2.04
73	0.7423	0.7940	0.8484	6.86%	2.08
74	0.7174	0.7678	0.8211	6.93%	2.11
75	0.6935	0.7427	0.7947	7.00%	2.14
76	0.6704	0.7185	0.7693	7.07%	2.18
77	0.6483	0.6952	0.7449	7.15%	2.21
78	0.6270	0.6728	0.7214	7.22%	2.25
79	0.6064	0.6512	0.6987	7.29%	2.28
80	0.5867	0.6304	0.6768	7.36%	2.31
81	0.5677	0.6104	0.6557	7.42%	2.35
82	0.5494	0.5911	0.6353	7.49%	2.38
83	0.5317	0.5724	0.6157	7.56%	2.42
84	0.5147	0.5545	0.5968	7.63%	2.45
85	0.4983	0.5372	0.5786	7.70%	2.49
86	0.4826	0.5205	0.5610	7.77%	2.52
87	0.4674	0.5044	0.5440	7.84%	2.56
88	0.4527	0.4889	0.5275	7.90%	2.59
89	0.4386	0.4739	0.5117	7.97%	2.63
90	0.4249	0.4595	0.4964	8.04%	2.67

T	Rmin	Rcent	Rmax	DR	DT(°C)
91	0.4118	0.4455	0.4816	8.10%	2.70
92	0.3991	0.4321	0.4674	8.17%	2.74
93	0.3868	0.4191	0.4536	8.24%	2.77
94	0.3750	0.4065	0.4402	8.30%	2.81
95	0.3636	0.3944	0.4274	8.37%	2.85
96	0.3526	0.3826	0.4149	8.43%	2.88
97	0.3419	0.3713	0.4029	8.50%	2.92
98	0.3317	0.3604	0.3912	8.56%	2.96
99	0.3217	0.3498	0.3800	8.63%	3.00
100	0.3121	0.3396	0.3691	8.69%	3.03
101	0.3029	0.3297	0.3586	8.76%	3.07
102	0.2939	0.3201	0.3484	8.82%	3.11
103	0.2853	0.3109	0.3385	8.88%	3.15
104	0.2769	0.3019	0.3290	8.95%	3.19
105	0.2688	0.2933	0.3197	9.01%	3.22
106	0.2610	0.2849	0.3108	9.07%	3.26
107	0.2534	0.2768	0.3021	9.14%	3.30
108	0.2461	0.2690	0.2937	9.20%	3.34
109	0.2390	0.2614	0.2856	9.26%	3.38
110	0.2321	0.2540	0.2777	9.33%	3.42

Note: T : Temperature(°C)
Rmin : Minimum value of Resistance
Rcent : Central value of Resistance
Rmax : Maximum value of Resistance
DR : Deviation Ratio
DT : Deviation Temperature

Thermistor: 103HF

T	Rmin	Rcent	Rmax	DR	DT(°C)
-30	159.2	173.8	189.6	9.05%	1.42
-29	150.0	163.6	178.2	8.92%	1.41
-28	141.4	154.0	167.5	8.79%	1.40
-27	133.3	145.0	157.6	8.66%	1.39
-26	125.8	136.6	148.3	8.53%	1.38
-25	118.7	128.8	139.6	8.40%	1.37
-24	112.0	121.4	131.4	8.27%	1.36
-23	105.8	114.5	123.8	8.15%	1.35
-22	99.89	108.0	116.7	8.02%	1.33
-21	94.38	101.9	110.0	7.90%	1.32
-20	89.20	96.22	103.7	7.77%	1.31
-19	84.34	90.87	97.82	7.65%	1.30
-18	79.76	85.84	92.30	7.53%	1.29
-17	75.46	81.12	87.13	7.40%	1.28
-16	71.42	76.69	82.28	7.28%	1.26
-15	67.61	72.52	77.72	7.16%	1.25
-14	64.03	68.61	73.44	7.04%	1.24
-13	60.66	64.92	69.42	6.93%	1.23
-12	57.48	61.45	65.64	6.81%	1.22
-11	54.49	58.19	62.09	6.69%	1.20
-10	51.67	55.12	58.74	6.58%	1.19
-9	49.01	52.23	55.60	6.46%	1.18
-8	46.51	49.50	52.65	6.35%	1.16
-7	44.14	46.94	49.86	6.23%	1.15
-6	41.91	44.52	47.24	6.12%	1.14
-5	39.80	42.23	44.77	6.01%	1.13
-4	37.81	40.08	42.45	5.90%	1.11
-3	35.94	38.05	40.25	5.79%	1.10
-2	34.16	36.13	38.19	5.68%	1.09
-1	32.48	34.32	36.24	5.57%	1.07
0	30.90	32.62	34.40	5.46%	1.06
1	29.40	31.00	32.66	5.36%	1.04
2	27.98	29.48	31.02	5.25%	1.03
3	26.64	28.03	29.48	5.15%	1.02
4	25.37	26.67	28.01	5.04%	1.00
5	24.16	25.38	26.63	4.94%	0.99
6	23.03	24.16	25.33	4.83%	0.97
7	21.95	23.01	24.09	4.73%	0.96
8	20.92	21.91	22.93	4.63%	0.95
9	19.96	20.88	21.82	4.53%	0.93
10	19.04	19.90	20.78	4.43%	0.92

T	Rmin	Rcent	Rmax	DR	DT(°C)
11	18.17	18.97	19.79	4.33%	0.90
12	17.34	18.09	18.85	4.23%	0.89
13	16.55	17.25	17.97	4.13%	0.87
14	15.81	16.46	17.13	4.03%	0.86
15	15.10	15.71	16.33	3.93%	0.84
16	14.43	15.00	15.57	3.84%	0.83
17	13.79	14.32	14.86	3.74%	0.81
18	13.19	13.68	14.18	3.65%	0.80
19	12.61	13.07	13.54	3.55%	0.78
20	12.06	12.49	12.92	3.46%	0.76
21	11.54	11.94	12.34	3.37%	0.75
22	11.05	11.42	11.79	3.27%	0.73
23	10.58	10.92	11.27	3.18%	0.72
24	10.13	10.45	10.77	3.09%	0.70
25	9.700	10.00	10.30	3.00%	0.68
26	9.277	9.572	9.868	3.09%	0.71
27	8.875	9.165	9.456	3.18%	0.73
28	8.492	8.777	9.064	3.27%	0.76
29	8.128	8.408	8.691	3.36%	0.79
30	7.781	8.057	8.335	3.45%	0.81
31	7.452	7.722	7.995	3.53%	0.84
32	7.138	7.403	7.671	3.62%	0.86
33	6.839	7.099	7.362	3.71%	0.89
34	6.554	6.809	7.067	3.79%	0.92
35	6.282	6.532	6.786	3.88%	0.94
36	6.024	6.268	6.517	3.97%	0.97
37	5.777	6.016	6.260	4.05%	1.00
38	5.542	5.776	6.015	4.14%	1.02
39	5.317	5.547	5.781	4.22%	1.05
40	5.103	5.328	5.557	4.31%	1.08
41	4.899	5.119	5.343	4.39%	1.10
42	4.704	4.919	5.139	4.47%	1.13
43	4.518	4.728	4.943	4.55%	1.16
44	4.340	4.545	4.756	4.64%	1.19
45	4.170	4.371	4.577	4.72%	1.22
46	4.008	4.204	4.406	4.80%	1.25
47	3.853	4.044	4.242	4.88%	1.27
48	3.704	3.892	4.085	4.96%	1.30
49	3.563	3.746	3.934	5.04%	1.33
50	3.427	3.606	3.790	5.12%	1.36

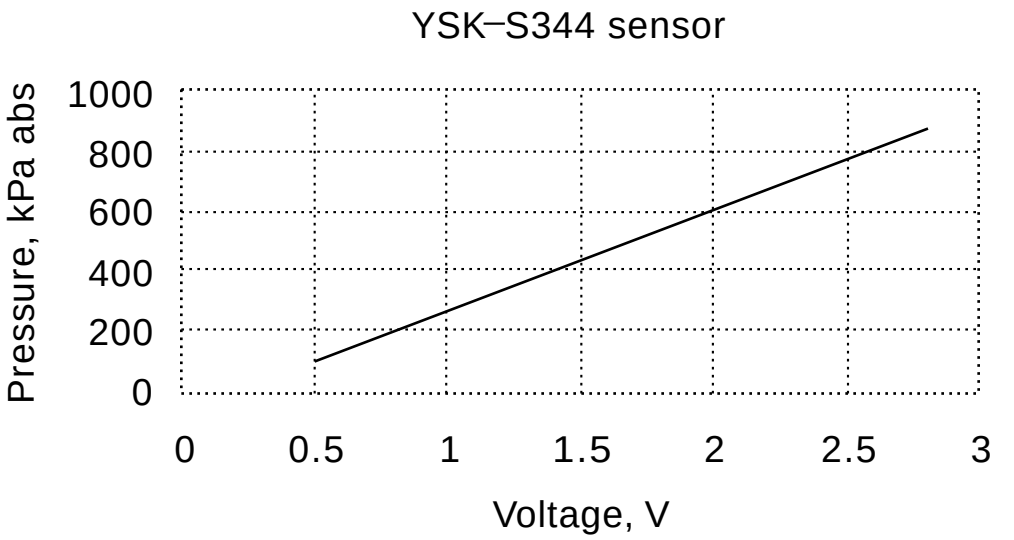
T	Rmin	Rcent	Rmax	DR	DT(°C)
51	3.297	3.472	3.652	5.20%	1.39
52	3.173	3.344	3.520	5.28%	1.42
53	3.054	3.221	3.394	5.36%	1.45
54	2.940	3.103	3.272	5.44%	1.48
55	2.832	2.990	3.155	5.52%	1.51
56	2.727	2.882	3.044	5.59%	1.54
57	2.627	2.779	2.936	5.67%	1.57
58	2.532	2.680	2.834	5.75%	1.60
59	2.440	2.584	2.735	5.83%	1.63
60	2.352	2.493	2.640	5.90%	1.66
61	2.267	2.405	2.549	5.98%	1.69
62	2.187	2.321	2.462	6.05%	1.72
63	2.109	2.240	2.378	6.13%	1.76
64	2.035	2.163	2.297	6.20%	1.79
65	1.963	2.088	2.219	6.28%	1.82
66	1.894	2.017	2.145	6.35%	1.85
67	1.829	1.948	2.073	6.43%	1.88
68	1.765	1.882	2.004	6.50%	1.91
69	1.705	1.818	1.938	6.57%	1.95
70	1.646	1.757	1.874	6.64%	1.98
71	1.590	1.699	1.813	6.72%	2.01
72	1.536	1.642	1.754	6.79%	2.04
73	1.485	1.588	1.697	6.86%	2.08
74	1.435	1.536	1.642	6.93%	2.11
75	1.387	1.485	1.589	7.00%	2.14
76	1.341	1.437	1.539	7.07%	2.18
77	1.297	1.390	1.490	7.15%	2.21
78	1.254	1.346	1.443	7.22%	2.25
79	1.213	1.302	1.397	7.29%	2.28
80	1.173	1.261	1.354	7.36%	2.31
81	1.135	1.221	1.311	7.42%	2.35
82	1.099	1.182	1.271	7.49%	2.38
83	1.063	1.145	1.231	7.56%	2.42
84	1.029	1.109	1.194	7.63%	2.45
85	0.9967	1.074	1.157	7.70%	2.49
86	0.9651	1.041	1.122	7.77%	2.52
87	0.9347	1.009	1.088	7.84%	2.56
88	0.9054	0.9778	1.055	7.90%	2.59
89	0.8771	0.9479	1.023	7.97%	2.63
90	0.8498	0.9190	0.9928	8.04%	2.67

T	Rmin	Rcent	Rmax	DR	DT(°C)
91	0.8235	0.8911	0.9633	8.10%	2.70
92	0.7981	0.8641	0.9347	8.17%	2.74
93	0.7736	0.8381	0.9071	8.24%	2.77
94	0.7500	0.8130	0.8805	8.30%	2.81
95	0.7272	0.7887	0.8547	8.37%	2.85
96	0.7051	0.7653	0.8298	8.43%	2.88
97	0.6839	0.7426	0.8058	8.50%	2.92
98	0.6633	0.7208	0.7825	8.56%	2.96
99	0.6435	0.6996	0.7600	8.63%	3.00
100	0.6243	0.6792	0.7382	8.69%	3.03
101	0.6057	0.6594	0.7171	8.76%	3.07
102	0.5878	0.6403	0.6967	8.82%	3.11
103	0.5705	0.6218	0.6770	8.88%	3.15
104	0.5538	0.6039	0.6579	8.95%	3.19
105	0.5376	0.5866	0.6394	9.01%	3.22
106	0.5219	0.5698	0.6215	9.07%	3.26
107	0.5068	0.5536	0.6042	9.14%	3.30
108	0.4921	0.5379	0.5874	9.20%	3.34
109	0.4780	0.5227	0.5711	9.26%	3.38
110	0.4643	0.5080	0.5554	9.33%	3.42

Note: T : Temperature(°C)
Rmin : Minimum value of Resistance
Rcent : Central value of Resistance
Rmax : Maximum value of Resistance
DR : Deviation Ratio
DT : Deviation Temperature

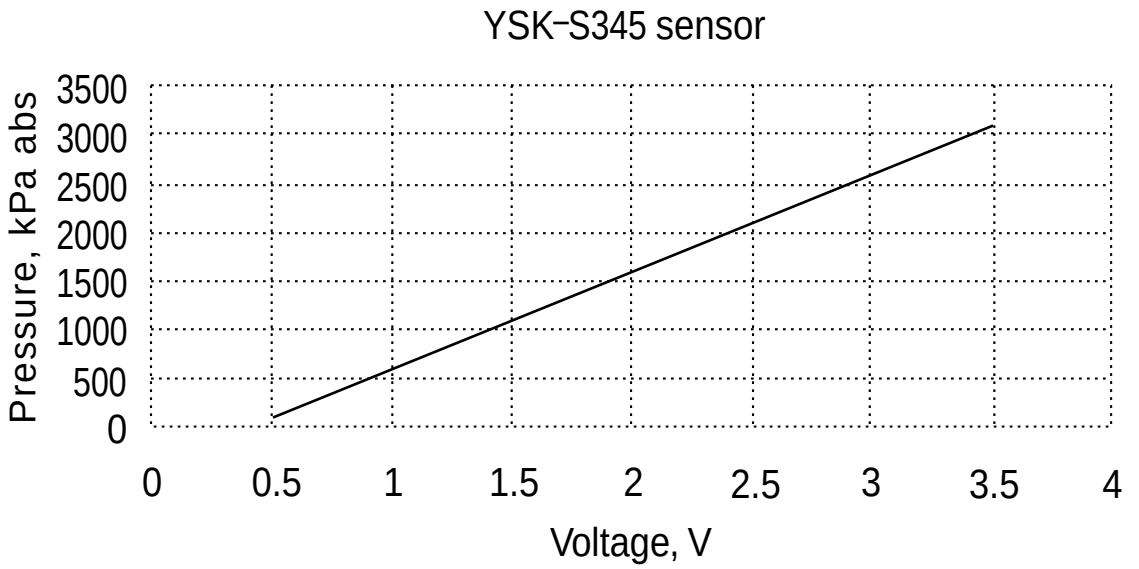
Voltage-Pressure Table

Low pressure sensor



Voltage, V	P, kPa	Tbub, °C	Voltage, V	P, kPa	Tbub, °C	Voltage, V	P, kPa	Tbub, °C
0.5	101	-43.9	1.28	361	-13.2	2.06	621	2.8
0.53	111	-41.9	1.31	371	-12.5	2.09	631	3.3
0.56	121	-40.0	1.34	381	-11.7	2.12	641	3.8
0.59	131	-38.3	1.37	391	-11.0	2.15	651	4.3
0.62	141	-36.7	1.4	401	-10.3	2.18	661	4.8
0.65	151	-35.1	1.43	411	-9.6	2.21	671	5.3
0.68	161	-33.6	1.46	421	-8.9	2.24	681	5.7
0.71	171	-32.3	1.49	431	-8.2	2.27	691	6.2
0.74	181	-30.9	1.52	441	-7.6	2.3	701	6.7
0.77	191	-29.6	1.55	451	-6.9	2.33	711	7.1
0.8	201	-28.4	1.58	461	-6.3	2.36	721	7.6
0.83	211	-27.2	1.61	471	-5.6	2.39	731	8.0
0.86	221	-26.1	1.64	481	-5.0	2.42	741	8.5
0.89	231	-25.0	1.67	491	-4.4	2.45	751	8.9
0.92	241	-23.9	1.7	501	-3.8	2.48	761	9.4
0.95	251	-22.9	1.73	511	-3.2	2.51	771	9.8
0.98	261	-21.9	1.76	521	-2.6	2.54	781	10.2
1.01	271	-20.9	1.79	531	-2.1	2.57	791	10.7
1.04	281	-20.0	1.82	541	-1.5	2.6	801	11.1
1.07	291	-19.1	1.85	551	-0.9	2.63	811	11.5
1.1	301	-18.2	1.88	561	-0.4	2.66	821	11.9
1.13	311	-17.3	1.91	571	0.2	2.69	831	12.3
1.16	321	-16.5	1.94	581	0.7	2.72	841	12.7
1.19	331	-15.6	1.97	591	1.2	2.75	851	13.1
1.22	341	-14.8	2	601	1.8	2.78	861	13.5
1.25	351	-14.0	2.03	611	2.3	2.81	871	13.9

High pressure sensor



Voltage, V	P, kPa	Tbub, °C	Voltage, V	P, kPa	Tbub, °C	Voltage, V	P, kPa	Tbub, °C
1.28	881	14.3	2.06	1661	38.0	2.84	2441	54.4
1.31	911	15.5	2.09	1691	38.7	2.87	2471	54.9
1.34	941	16.6	2.12	1721	39.4	2.9	2501	55.5
1.37	971	17.7	2.15	1751	40.2	2.93	2531	56.0
1.4	1001	18.8	2.18	1781	40.9	2.96	2561	56.5
1.43	1031	19.8	2.21	1811	41.5	2.99	2591	57.1
1.46	1061	20.9	2.24	1841	42.2	3.02	2621	57.6
1.49	1091	21.9	2.27	1871	42.9	3.05	2651	58.1
1.52	1121	22.9	2.3	1901	43.6	3.08	2681	58.6
1.55	1151	23.8	2.33	1931	44.2	3.11	2711	59.1
1.58	1181	24.8	2.36	1961	44.9	3.14	2741	59.6
1.61	1211	25.7	2.39	1991	45.5	3.17	2771	60.1
1.64	1241	26.6	2.42	2021	46.1	3.2	2801	60.6
1.67	1271	27.5	2.45	2051	46.8	3.23	2831	61.1
1.7	1301	28.4	2.48	2081	47.4	3.26	2861	61.6
1.73	1331	29.3	2.51	2111	48.0	3.29	2891	62.1
1.76	1361	30.1	2.54	2141	48.6	3.32	2921	62.6
1.79	1391	31.0	2.57	2171	49.2	3.35	2951	63.1
1.82	1421	31.8	2.6	2201	49.8	3.38	2981	63.5
1.85	1451	32.6	2.63	2231	50.4	3.41	3011	64.0
1.88	1481	33.4	2.66	2261	51.0	3.44	3041	64.5
1.91	1511	34.2	2.69	2291	51.6	3.47	3071	64.9
1.94	1541	35.0	2.72	2321	52.1	3.5	3101	65.4
1.97	1571	35.8	2.75	2351	52.7			
2	1601	36.5	2.78	2381	53.3			
2.03	1631	37.3	2.81	2411	53.8			

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